



INSTITUTE FOR DEFENSE ANALYSES

Developing an Adaptability Training Strategy and Policy for the DoD

Interim Report

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Waldo D. Freeman

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PREFACE

This document reports the work performed by the Institute for Defense Analyses for the Office of the Deputy Under Secretary of Defense (Readiness) in partial fulfillment of the task entitled “Developing an Adaptability Strategy Training Policy for the Department of Defense (DoD).”

The authors wish to thank the reviewers, Dr. J. D. Fletcher, Dr. John E. Morrison and Dr. Patricia Romano McGraw. Their comments and suggestions have led to greater clarity in articulating the complex issues of the subject at hand, and the recommendations of each were incorporated into the paper to the degree possible. The authors, however, remain solely responsible for the content and any possible errors. The reviewers also suggested specific areas for further related research, which the authors fully intend to pursue as the study continues. A number of those areas are described in the report.

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SUMMARY

The Office of the Deputy Under Secretary of Defense (Readiness) asked IDA to support it in the development of an adaptability training strategy and to provide suggested revisions to current training policy to implement such a strategy. Additionally and in parallel IDA was to assist in the development and execution of a related proof-of-concept experiment. This tasking came as a follow-on to a previous study IDA conducted that found, given the uncertainty of current and future threats, the key skill or attribute that individuals, units, and teams of commanders and leaders need to acquire is adaptability.

In the original study, IDA developed a specific model of adaptability. The model corresponds to a definition of adaptability: “the operable capacity to bring about an effective response to an altered situation.” Thus, we consider adaptability to be a metaskill that requires the integration of both cognitive and relational skills. This model is depicted in figure S-1.

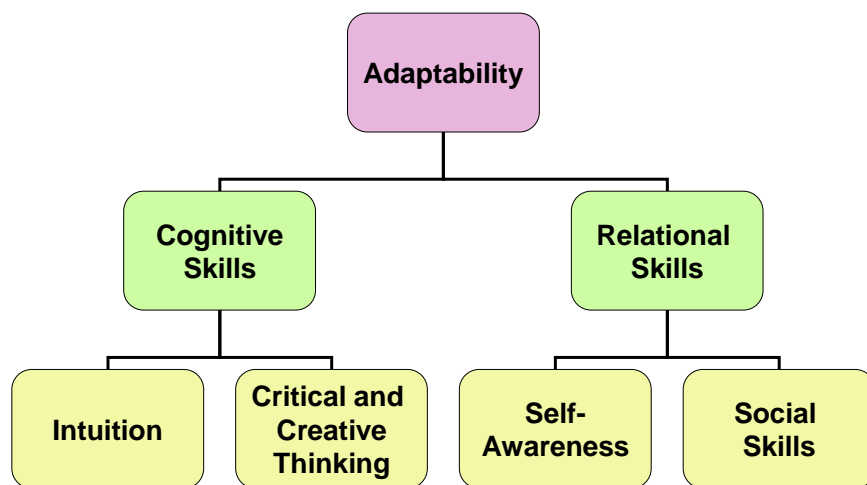


Figure S1. IDA Adaptability Model from Original Study

We divided the study into two parts. In phase one, we conducted a comprehensive survey of current adaptability training initiatives undertaken in various military and non-military venues. We then determined the “best of breed” among those initiatives, assessed experiments intended to demonstrate the feasibility and effectiveness of initiatives, and sought to identify metrics associated with each initiative and experiment. Based on these findings, we developed recommendations for the goals and elements of a proof-of-concept adaptability training experiment to be conducted by another organization—an experiment intended to determine if intentional training can produce more adaptive performance. Finally, this interim report provides preliminary recommendations for changes to training policy intended to promote adaptability training.

In phase two of the study, we will monitor the development and execution of an adaptability training experiment by an organization designated by the Office of the Deputy Under Secretary of Defense (Readiness), will develop an adaptability training strategy framework that updates the draft “Learning Adaptability Strategy” presented in conjunction with the earlier study, “Learning to Adapt to Asymmetric Threats,” and will make final recommendations for changes to training policy intended to promote adaptability training.

An initial effort and particularly productive aspect of our survey was a symposium which we facilitated at IDA headquarters in December 2007, to which DoD invited the Services to present their “best-of-breed” adaptability training initiatives. The most wide-ranging aspect of our study has been our effort to identify adaptability-related training and education efforts in other government agencies, industry, and foreign militaries.

We have taken all of our findings and analyzed them in the context of the IDA model for adaptability and with a view towards the range and types of tasks the military may be called upon to perform. This has produced several major findings, four of which are fundamental to the purposes of this study. First, all of our discussions, within and without the U.S. military, have tended to validate the IDA model of adaptability, which integrates both cognitive and relational aspects of performance and which has practical meaning for implementation of learning initiatives. Second, adaptability learning is a function of education and experience, as well as training; and the greatest adaptability learning occurs in those situations where adaptability learning in one sphere is reinforced by similar learning in both of the other spheres. Third, the key to developing adaptable

leaders, leader teams, and units at every level is repeated exposure to “crucible experiences” that are commensurate with the operational environment and level of responsibility of each. Finally, though there is wide-spread acknowledgment of the need to develop the adaptability of individuals, units, and commander/leader teams, we found only two examples of purpose-designed adaptability training and no examples with metrics to measure the effectiveness of the training.

Taking into account the nature of adaptability and efforts to develop it to date, we consider that a “proof-of-concept” adaptability training experiment, if it is to produce meaningful results, will seek to improve performance on all four key components of the IDA model, be based around multiple simulated “crucible experience” scenarios requiring behavioral responses, and include scientifically acceptable metrics. Key to a successful experiment will be the early participation of all the Services, as well as behavioral and social scientists with experience in adaptability-related training and education. Finding new ways to prepare to respond effectively across the Range of Military Operations (ROMO) in the current unpredictable joint operating environment (JOE) will require serious and committed effort and a consensus among leaders in all the Services. There are a variety of approaches that appear feasible with regard to an experiment, and we discuss several options.

Our preliminary training policy recommendations recognize that any effort to be effective must be part of a comprehensive plan throughout DoD to enhance adaptability. We also recognize the limited time available for training and the value of traditional training focused on tactics, techniques, and procedures. Thus, our preliminary recommendations emphasize ensuring that existing exercises are structured to include “crucible experience” training events and routine training consists of more variety and less repetition. Such training practices would be fully consistent with the on-the-job, but often costly, development of adaptability observed in young men and women who are meeting new and unpredictable situations in the crucibles of Iraq and Afghanistan.

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I. INTRODUCTION

A. PURPOSE

IDA was tasked to support the Office of the Deputy Under Secretary of Defense (Readiness) in the development of an adaptability training strategy and related proof of concept experiment and to provide suggested revisions to current training policy to implement such a strategy. This document provides an interim report on key findings to date. Specifically, this report details initial results of research done to support development of an adaptability training strategy and proof-of-concept experiment, including recommended elements of such an experiment. The report describes actions required to complete the task, offers potential alternatives for proceeding with the task, and provides preliminary suggestions with regard to potential training policy changes, which are intended to promote the development of adaptability. Finally, the report makes recommendations with regard to potentially productive avenues for future research.

B. BACKGROUND

In June 2004, The Office of the Deputy Under Secretary of Defense (Readiness) tasked IDA to conduct research that would assist it in the development of a training and exercise environment that would prepare U.S. forces to respond to asymmetric threats. In August 2005, IDA issued a report of its findings.¹ IDA concluded that asymmetric threats were only one aspect of the current and future operating environments, the chief characteristic of which is unpredictability. The report went on to make the case that given the uncertainty of current and future threats, the key skill or attribute that individuals, units, and teams of commanders and leaders need to improve on is adaptability. IDA depicted adaptability in very specific terms as a metaskill that requires the integration of both cognitive and relational skills. The study also explored the requirements for learning to be adaptable. Following submission of the formal report and as called for in the original tasking, IDA provided a draft training roadmap, entitled “Learning Adaptability Strategy.” The process of developing that draft led the study sponsors and IDA researchers to understand that additional research and an experiment to

¹ John Tillson, et al., *Learning to Adapt to Asymmetric Threats*, IDA Document D-3114, Institute for Defense Analyses, August 2005.

prove the feasibility of actually training adaptability were required in order to gain broad support within the Services for training policy changes aimed at pursuing an adaptability training strategy. Subsequently, in May 2007, The Office of the Deputy Under Secretary of Defense (Readiness) tasked IDA to undertake the current study, which is intended to support that office in the development of an adaptability training strategy, in the conduct of an associated proof-of-concept experiment to provide tangible support for such a strategy, and in the revision of current training policy to implement such a strategy.

C. STUDY OVERVIEW

The study was divided into two phases. We have completed Phase I of the study, and this report offers options and makes recommendations with regard to the conduct of Phase II of the study.

Specifically, in Phase I, we:

- Conducted a comprehensive survey of current adaptability training initiatives undertaken by:
 - The four military Services
 - Other government agencies
 - Industry
 - Academia
 - Selected foreign militaries
- Analyzed salient elements of each initiative and determined the “best of breed” among those initiatives
- Assessed experiments intended to demonstrate the feasibility and effectiveness of initiatives
- Sought to identify metrics associated with initiatives and experiments
- Identified what we recommend as the goals and elements of a proof-of-concept adaptability training experiment to be conducted by another organization
- Developed preliminary recommendations for changes to training policy intended to promote adaptability training

In Phase II of the study, which is currently ongoing, we are tasked to:

- Monitor the development and execution of an adaptability training experiment by an organization designated by the Office of the Deputy Under Secretary of Defense (Readiness)

- Develop an adaptability training strategy framework that updates the draft “Learning Adaptability Strategy” presented in conjunction with the earlier study, “Learning to Adapt to Asymmetric Threats”
- Make final recommendations for changes to training policy intended to promote adaptability training

In Phase I, the Services presented the best they have to offer in the area of adaptability-related training, and we conducted an extensive review of adaptability training initiatives in other venues. Based on this research, we identified the essential elements of a proof-of-concept experiment, the results of which would be considered meaningful and of value to all the Services. In Phase II, we are prepared to monitor the development and execution of such an experiment by a designated organization. In parallel with that effort, we will develop an adaptability learning strategy framework as the basis for a sound policy to promote the capacity for adaptability that individuals, units and commander/leader teams will require in the current and future operating environments.

D. METHODOLOGY

In carrying out the first phase of this study, conducting a comprehensive survey of current adaptability training initiatives, we sought to obtain information from as wide a range of sources as possible. We recognized that the development of adaptability skills is important, not just to the military, but throughout government and the business world. We also recognized that non-U.S. entities have an equal interest in the subject. With these considerations in mind, we undertook a variety of research initiatives.

With the cooperation and assistance of our sponsor and Naval Air Warfare Center Training Systems Division (NAWCTSD), Orlando, Florida, we posted a Request for Information (RFI) on the government sponsored website Fed Biz Opps.² The RFI specifically sought information concerning existing training and education programs being employed in industry, academia, and other government agencies that are designed to develop and enhance adaptability skills and the four components thereof as defined by IDA in its original study.

Our original study and draft strategy for adaptability training recognized the potential role of technology. Specifically, we postulated that well-designed simulations could enhance the experience level of the target training audience in a variety of venues, reach a broad audience, and do so much more inexpensively than would be the case with

² RFI is at Appendix B.

live training. Accordingly, we attended the annual Interservice/Industry Training, Simulation & Education Conference (I/ITSEC) in November 2007. Attendance at the conference allowed us to witness demonstrations of a number of existing programs with relevance for adaptability training, to attend symposiums and the presentation of papers related to developing adaptability, and to meet industry representatives and research personnel involved in work related to our study.

The most productive aspect of our survey, to date, was a symposium which we facilitated at IDA headquarters in December 2007. At the invitation of the Deputy Under Secretary of Defense (Readiness), each of the Services sent representatives to present their “best of breed” programs³ for developing adaptability and adaptability-related skills. Academics, consultants with a history of working with the military on adaptability-related training, and other IDA personnel working on related projects or with a background in adaptability-related research also attended. In addition to the information gathered during briefings, we benefited from the rich dialogue among participants and developed a network of researchers interested in adaptability learning. This network has since allowed significant follow-up, both in terms of opportunities for additional research and in terms of experts with whom we have been able to vet our findings as we have progressed.

Recognizing that the invitation to all the Services to attend the symposium in December had inadvertently failed to include those organizations tasked to provide joint education and training, we subsequently contacted and met with key individuals in those joint organizations. Our ongoing dialogue with the staff at the National Defense University has been of particular value

The most wide-ranging aspect of our study has been our effort to identify adaptability-related training and education efforts in other government agencies, industry, and foreign militaries. Within the government, we focused primarily on various intelligence organizations, all of which have undertaken initiatives to improve the preparation of their analysts in areas related to adaptability. With regard to foreign militaries, we have benefited from a limited number of contacts within allied military organizations, from a review of select articles, documents, and reports, both foreign and domestic, and from related work being done for our sponsor by the RAND Corporation concerning current training methodologies being used by specific foreign militaries. Our research into adaptability-related training being conducted by industry for the benefit of

³ A listing of Service Briefings is at Appendix C.

its employees has focused on initiatives that go beyond improving organizational efficiency. This has included, in particular, investigating techniques employed by private organizations devoted to providing leadership research, education, and training.

In every case, we have taken our findings and analyzed them in the context of the IDA model for adaptability and with a view towards the range and types of tasks the military may be called upon to perform. We have been aided in our analysis throughout by training experts at IDA and by academics and other researchers studying adaptability issues, with whom we have frequently vetted our findings.

Though we now have sufficient information to prepare an informed interim report, the nature of this study is such that we will continue to explore techniques for teaching and training adaptability as we proceed to monitor the development and execution of an experiment intended to demonstrate the feasibility of improving adaptability through training specifically designed for that purpose.

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II. RESULTS TO DATE

A. INTRODUCTION

In our original study, we developed a model of adaptability—henceforth referred to as the IDA model of adaptability, which continues to be subject to review and, potentially, to modification. Our survey and other research have given us the opportunity to validate the IDA model of adaptability, provided insights about the complexity of adaptability learning, allowed us to identify the “best of breed” adaptability training initiatives, and revealed sufficient information to permit us to identify goals and elements of a proof-of-concept adaptability training experiment.

B. IDA MODEL OF ADAPTABILITY

An important initial finding is that the IDA model of adaptability generally has been accepted by those who have studied it. During the December symposium at IDA, neither Service representatives nor other attendees challenged it. The original model used then is depicted in Figure 1.

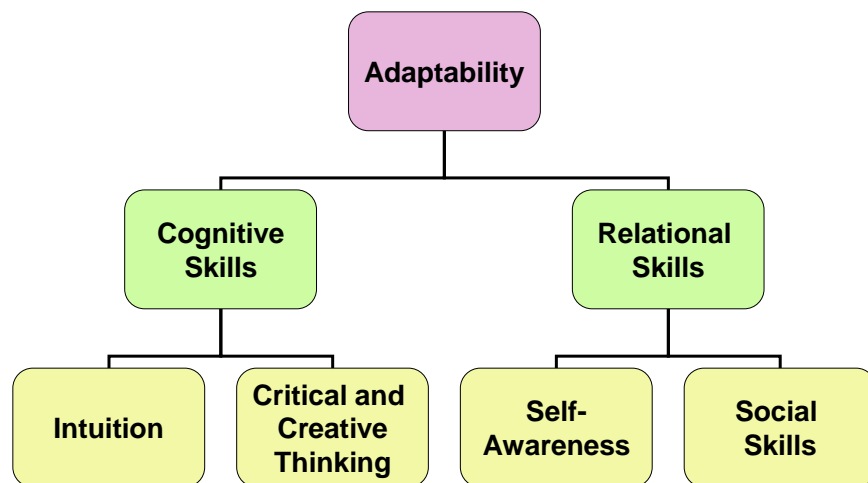


Figure 1. IDA Adaptability Model from Original Study

This parsimonious depiction reflects the notion that adaptability is itself a capability. That capability has been defined by the Army Research Institute (ARI) as an “effective change in response to an altered situation.”⁴ We go further and say that adaptability is not the change itself, nor is it simply a latent human quality. Rather, it is a metaskill that requires the integration of both cognitive and relational skills. Implied in the ARI definition is the willingness or strength of character necessary to take action in order to bring about effective change. In that sense, adaptability is like courage: until it is demonstrated, one cannot be sure it exists. Adaptability requires the capacity to take decisive and effective action in a timely manner, often under pressure. Therefore we view adaptability not simply as a potential capability, but as “the operable capacity to bring about an effective response to an altered situation.” It is the outcome of behavior by operators. Finally, we note, without changing our definition of adaptability, that the IDA model focuses on those aspects of adaptability susceptible to learning interventions, and that there are other factors that contribute to adaptability, including individual predisposition and organizational openness.

To reiterate: adaptability, as we have defined it, is the metaskill required to respond effectively to a changed situation and, specifically, to an unpredicted change. The metaskill requires the development and integration of specific component skills. It is not an internal quality, nor is it a value latent in a culture. One reviewer observed:

From a neuroscience perspective, adaptability is a core function of the brain and related neural systems. The nervous system is never at rest and is always in the act of scanning the environment and re-adjusting to changes as they occur.

The latest research documents the fact that brain/behavior relationships operate in a holistic way that includes the variables presented in the [IDA] adaptability model as presently conceived. The necessary inclusion of emotion based variables along with cognitive knowledge is consistent with information on how the brain really works.⁵

The IDA model acknowledges the basic adaptability functioning of the human brain and the fact that everyone is inherently adaptable to some degree, and the model is then used to describe adaptability in terms of cognitive and relational components and to suggest how development of those components in an holistic manner can lead to the development of the higher level metaskill of adaptability. Similarly with regard to the idea of adaptability as a value—latent in a culture or something to be inserted into routine

⁴ Army Research Institute for the Behavioral and Social Sciences, “Developing Adaptive Proficiency in Special Forces Officers,” Research Report 1831, February 2005, p. 2.

⁵ Patricia Romano McGraw, review of *Developing an Adaptability Training Strategy and Policy for the DoD* (draft), IDA Paper P-4358, Institute for Defense Analyses, August 15, 2008.

training: Developing and preserving adaptability as a metaskill in the IDA model requires that organizations value and promote adaptability, but it is as a metaskill and not as a value that adaptability has operational significance. In this sense, the metaskill of adaptability is a capability necessary for successful operations in the current operating environment. The Secretary of Defense recently related such capabilities to culture:

In the end, the military capabilities we need cannot be separated from the cultural traits and reward structure of the institutions we have: the signals sent by what gets funded, who gets promoted, what is taught in the academies and staff colleges, and how we train.⁶

Thus, the desired capability or metaskill of adaptability requires a culture in which its systems of education, training, and promotion promote the development of adaptability.

C. DEFINITION OF COMPONENTS OF ADAPTABILITY

The original IDA study, which led to the IDA model of adaptability, built on the work of numerous scholars and researchers, some of whom are mentioned below. An excellent example of this on the cognitive side of the IDA model is the effort of Dr. J. D. Fletcher to describe cognitive readiness, which he defined as the “mental preparation (including skills, knowledge, abilities, motivations, and personal dispositions) an individual needs to establish and sustain competent performance in the complex and unpredictable environment of modern military operations.”⁷ Dr. Fletcher suggested that cognitive readiness required the ability to:

- Recognize patterns in chaotic situations
- Modify problem solutions associated with these patterns as required by the current situation
- Implement plans of actions based on those solutions⁸

Pattern recognition (an essential part of intuition), modifying problem solutions (identifying novel approaches to a situation that are also effective), and implementing plans of action (decision making) are fundamental to the IDA model of adaptability. We include here a brief description of each component of that model.

Intuition, as defined in the work of Gary Klein,⁹ is the way in which individuals translate experience into action. Intuition is an aspect of macrocognition—“...the cognitive functions that are performed in natural (versus artificial laboratory) decision-

⁶ Robert M. Gates, Speech delivered at the National Defense University, Washington, D.C., September 29, 2008.

⁷ J.D. Fletcher, *Cognitive Readiness: Preparing for the Unexpected*, IDA Document D-3061, Institute for Defense Analyses, September 2004, p. 1.

⁸ Ibid., p. 4.

⁹ Gary Klein, *The Power of Intuition* (New York: Doubleday, January 2003).

making settings.”¹⁰ Whereas macrocognition is a relatively new term describing functions and processes still being defined and requiring further research, key features of cognition in naturalistic contexts are characteristic of situations requiring adaptability:

- Decisions are typically complex, often involving data overload.
- Decisions are often made under time pressure and involve high stakes and high risk.
- Goals are sometimes ill-defined, and multiple goals often conflict.
- Decisions must be made under conditions in which few things can be controlled or manipulated; indeed, many key variables and their interactions are not even fully understood.¹¹

Experience allows individuals to recognize what is going on in specific situations (make judgments) and guides them in how they react (make decisions) in those situations. In our original study, we accepted the idea that the greater the experience level of an individual and the more practiced he is in making decisions in a changing environment, the more prepared he will be to trust his judgment in new situations—to change his own actions in an effective manner in response to an altered situation. One defining characteristic of intuitive responding is its rapidity and lack of conscious awareness: based on experience, the intuitive performer recognizes the pattern of stimuli and responds without conscious analysis.

In contrast, critical and creative thinking are conscious processes. We have linked critical and creative thinking, though they are independent concepts, because an effective response to an altered situation will likely require both types of thinking to be performed in an iterative process as an understanding of the changing situation and the consequences of possible responses evolves. As described by Dr. Richard Paul and Dr. Linda Elder, “critical thinking is the art of analyzing and evaluating thinking with a view to improving it.”¹² It is the metacognitive process of analyzing one’s own thinking or the thinking of another. Creative thinking refers to the generation of novel ideas—innovative and imaginative responses to new or unexpected situations. Faced with an altered situation—whether one that is a variation of a familiar scenario or one that is entirely new, an individual or team is challenged to devise an effective response. Postulating a

¹⁰ G. Klein, K.G. Ross, B.M. Moon, D.E. Klein, R.R. Hoffman, E. Hollnagel, “Macrocognition,” *IEEE Intelligent System* 18, no.3 (May-June 2003): 81.

¹¹ Ibid.

¹² Richard Paul and Linda Elder, *The Miniature Guide to Critical Thinking: Concepts and Tools*, Foundation for Critical Thinking, 2006, p. 4.

response requires creative thinking, and evaluating the consequences and risks associated with that response requires critical thinking. By going through several iterations of such a process, the individual or group seeks to arrive at, if not the best, then at least an effective response.

Determining the best option for an effective response through either intuition or creative thinking requires formulation, either subconsciously or consciously, of a hypothesis explaining the new correlation of data (new situation) including their inter-relationships. The actions taken, or plans made are based upon this hypothesis (best understanding of the facts) not because it is certain to be right but because it appears to be most likely to be right at the time. It is like a doctor's diagnosis. This process is called "abductive inference" or "inference to the best explanation" in the philosophy of science.¹³

Self-awareness, as described by Prof. Douglas T. Hall of Boston University, "...refers to the extent to which people are conscious of various aspects of their identities and the extent to which their self-perceptions are internally integrated and congruent with the way others perceive them...Self-awareness, then, is a measure of the person's ability to be truly conscious of the components of the self and to observe it accurately and objectively."¹⁴ It includes an individual's recognition of the impact that he or she has on others. In a very practical sense, self-awareness is the ability realistically to recognize one's strengths and weaknesses and the ability to take those attributes into account effectively when considering how best to respond to a new situation.

Social skills are those relational skills that impact an individual's ability to work effectively with others. A key consideration that we brought to our earlier study was the recognition that teams and teams of teams—not individuals—do the work of the Department of Defense. Working effectively with others to respond effectively to change requires a broad range of social skills or competencies in order to manage the relationships involved. The Consortium for Research on Emotional Intelligence in Organizations catalogs broadly recognized competencies in two tests on its website.¹⁵ The Emotional Competence Inventory and the Emotional and Social Competency Inventory include competencies of social awareness—how people handle relationships

¹³ John R. and Susan G. Josephson, *Abductive Inference: Computation, Philosophy and Technology*, Cambridge University Press, 1996, p. 5.

¹⁴ D. T. Hall, "Self-Awareness, Identity, and Leader Development," in *Leader Development for Transforming Organizations*, D. V. Day, Stephen J. Zaccaro, Stanley M. Halpin, editors, Lawrence Erlbaum Associates, 2004, p. 154.

¹⁵ http://www.eiconsortium.org/measures/eci_360.html.

and awareness of others' feelings, needs, and concerns, and competencies of relationship management—the skill or adeptness at inducing desirable responses in others. The competencies include empathy, organizational awareness, service orientation, coaching and mentoring, inspirational leadership, change catalyst, influencing/persuading, conflict management, teamwork and collaboration. To that list, and in view of the variety of organizations and communities, in and out of government—foreign and domestic, with which today's military interacts, we add cross-cultural knowledge and skills that take into account cultural differences.

D. CONSIDERING MODIFICATIONS TO THE IDA MODEL

In the survey of adaptability training initiatives and related academic research we conducted as part of this study, we returned to the work of Dr. Daniel Goleman concerning emotional intelligence, with which we had become acquainted in our original study. In a seminal article, Goleman states: "...my research, along with other recent studies, clearly shows that emotional intelligence is the sine qua non of leadership. Without it, a person can have the best training in the world, an incisive, analytical mind, and an endless supply of smart ideas, but he still won't make a great leader."¹⁶ Goleman defines five components of emotional intelligence: self-awareness, self-regulation, motivation, empathy, and social skill. We consider that all five components are essential not only to great leaders, but for adaptive performance at all levels. In particular, we recognize the importance of self-regulation, which the original IDA model did not clearly articulate. Goleman defines self-regulation as "the ability to control or redirect disruptive impulses and moods [and] the propensity to suspend judgment—to think before acting" and describes the hallmarks of self-regulation as: "trustworthiness and integrity, comfort with ambiguity, [and] openness to change."¹⁷ In order to make explicit the fundamental importance of self-regulation to adaptive performance, we have modified our original exposition of the components of adaptability to include in place of "self-awareness," "self-awareness and self-regulation."

During the December 2007 symposium at IDA, Professor Michael D. Matthews of West Point presented his work with regard to non-cognitive predictors of soldier adaptability and performance.¹⁸ Based on his research, he argues persuasively that

¹⁶ Daniel Goleman, "What Makes a Leader?" *Harvard Business Review* (November-December 1998): 94.

¹⁷ *Ibid.*, p. 95.

¹⁸ Michael D. Matthews, "Non-Cognitive Predictors of Soldier Adaptability and Performance," brief presented at Adaptability Symposium 2007, December 2007.

adaptability requires, in addition to attributes that help soldiers to handle high cognitive loads, attributes that allow them to cope with high emotional loads. In particular, Professor Matthews makes the case for the importance of developing the attributes of resilience, hardiness, and grit (a measure of passionate pursuit of long term goals). We accept the importance of these attributes and have added them to our depiction of the components of adaptability. However, we also recognize that mental and physical toughness, corresponding to Matthews' resilience, hardiness, and grit, traditionally have been recognized as essential for military success and that militaries have historically sought to develop those qualities, particularly within their leaders. Therefore we have modified our model to include grit or resilience as an often necessary but not sufficient precondition for adaptable performance. Grit is important in most situations requiring adaptability, but we believe the focus of adaptability learning essential to cope with an unpredictable environment should remain on the original IDA model components, refined by the addition of the concept of self-regulation and depicted in Figure 2. This figure also emphasizes the idea that adaptability is not a latent quality, but a tangible outcome of behavior by operators.

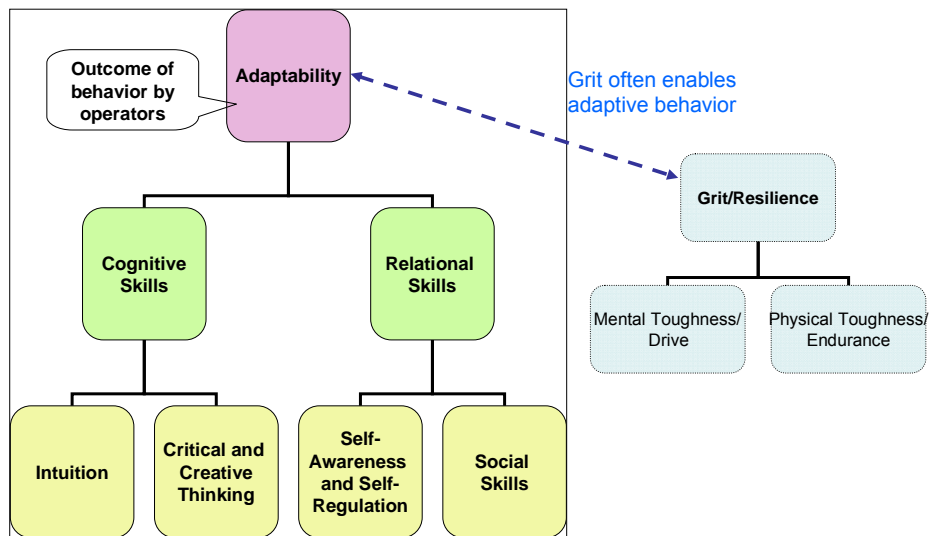


Figure 2. IDA Adaptability Model Enhanced with Grit/Resilience

In our ongoing survey of literature that reflects research concerning adaptability learning and during presentations at the adaptability training symposium we facilitated, we became acquainted with additional skills that have been prescribed as essential to

adaptability. Pulakos, Arad, Donovan, and Plamondon¹⁹ identified eight dimensions of adaptive performance:

- Handling emergencies or crisis situations
- Learning work tasks, technologies, and procedures
- Handling work stress
- Demonstrating interpersonal adaptability
- Displaying cultural adaptability
- Solving problems creatively
- Dealing effectively with unpredictable or changing work situations
- Demonstrating physically oriented adaptability

In contributing to the development of adaptability training used in the Army today, Dr. Elaine Raybourn of the Sandia Laboratories has taken into account specific skills that she considers essential in responding to the complexity of socially and ethically ambiguous situations faced by many military personnel today:²⁰

- Negotiation and consensus building skills
- Ability to communicate effectively across cultures
- Analyze ethically ambiguous situations
- Be self-aware
- Think innovatively
- Envision different courses of action
- Effectively use critical problem solving skills

Within an adaptability context, Dr. Richard Meinhardt at the Army War College emphasizes a strategic thinking framework²¹ that includes:

- Creative thinking
- Critical thinking

¹⁹ E.D. Pulakos, S. Arad, M.A. Donovan, and K.E. Plamondon, "Adaptability in the Workplace: Development of a Taxonomy of Adaptive Performance," *Journal of Applied Psychology*, 85 no. 4 (August 2000): 612-624. Also discussed in: Army Research Institute for the Behavioral and Social Sciences, "Developing Adaptive Proficiency in Special Forces Officers," Research Report 1831, February 2005, p. 2.

²⁰ Elaine M. Raybourn, *Training System Approaches for Honing Adaptive Thinking, Cultural Awareness and Metacognitive Agility*, brief presented at Adaptability Symposium 2007, December 2007.

²¹ Richard Meinhardt, *Strategic Thinking within the Context of Adaptability*, brief presented at Adaptability Symposium 2007, December 2007.

- Systems thinking
- Ethical thinking
- Thinking in time

We recognized above the importance of emotional intelligence to leadership in general and to adaptive leadership in particular. The Consortium for Research on Emotional Intelligence in Organizations has developed a test based on the emotional competencies identified by Dr. Daniel Goleman.²² The Emotional Competency Inventory (ECI) of the Consortium for Research on Emotional Intelligence in Organizations measures 18 competencies organized into four clusters: Self-Awareness, Self-Management, Social Awareness, and Relationship Management.

- **Self-Awareness** concerns knowing one's internal states, preferences, resources, and intuitions. The Self-Awareness cluster contains three competencies:
 - **Emotional Awareness:** Recognizing one's emotions and their effects
 - **Accurate Self-Assessment:** Knowing one's strengths and limits
 - **Self-Confidence:** A strong sense of one's self-worth and capabilities
- **Self-Management** refers to managing one's internal states, impulses, and resources. The Self-Management cluster contains six competencies:
 - **Emotional Self-Control:** Keeping disruptive emotions and impulses in check
 - **Transparency:** Maintaining integrity, acting congruently with one's values
 - **Adaptability:** Flexibility in handling change
 - **Achievement:** Striving to improve or meeting a standard of excellence
 - **Initiative:** Readiness to act on opportunities
 - **Optimism:** Persistence in pursuing goals despite obstacles and setbacks
- **Social Awareness** refers to how people handle relationships and awareness of others' feelings, needs, and concerns. The Social Awareness cluster contains three competencies:
 - **Empathy:** Sensing others' feelings and perspectives, and taking an active interest in their concerns
 - **Organizational Awareness:** Reading a group's emotional currents and power relationships
 - **Service Orientation:** Anticipating, recognizing, and meeting customers' needs

²² Daniel Goleman, *Working with Emotional Intelligence* (New York: Bantam Books, 1998).

- **Relationship Management** concerns the skill or adeptness at inducing desirable responses in others. The Relationship Management cluster contains six competencies:
 - **Developing Others:** Sensing others' development needs and bolstering their abilities
 - **Inspirational Leadership:** Inspiring and guiding individuals and groups
 - **Change Catalyst:** Initiating or managing change
 - **Influence:** .Wielding effective tactics for persuasion
 - **Conflict Management:** Negotiating and resolving disagreements
 - **Teamwork & Collaboration:** Working with others toward shared goals. Creating group synergy in pursuing collective goals.²³

We repeatedly have encountered in literature relevant to adaptability the idea and importance of sensemaking. Sensemaking can be perceived as an ongoing part of the process of recognizing, understanding, and responding to an altered situation—adapting. One definition of sensemaking is: "a motivated, continuous effort to understand connections (which can be among people, places, and events) in order to anticipate their trajectories and act effectively."²⁴ Thus sensemaking can be viewed as a form of, or at least closely related to, abductive inference, discussed above in relation to intuition and creative thinking.

We compared each of the specific skills or enablers listed above with our original depiction of the components of adaptability. We concluded that the IDA model stands up well compared to other taxonomies related to adaptability. All the capabilities listed above are accommodated by the original IDA model, as modified to include self-regulation and the concept of Grit. However, we conclude that the adaptability learning gap is in the cognitive and relational skills areas, and we argue that the military should continue to focus specifically on developing the cognitive and relational skills, assuming the continuing efforts of all the Services to develop the attributes of character and resilience that are foundational to adaptable performance.

As a final note, we recognize there are other attributes which might be plausible candidates for the model, some to which we have been introduced and others of which we have no knowledge. Examples of concepts or attributes of which we are aware include: adaptive expertise, situation awareness, domain knowledge, and pattern recognition.

²³ http://www.eiconsortium.org/measures/eci_360.html

²⁴ G. Klein, B. Moon, and R.F. Hoffman, "Making Sense of Sensemaking I: Alternative Perspectives," *IEEE Intelligent Systems* 21, no. 5 (July/August 2006): 70-73.

However at this point, we have considered such attributes as being implied or assumed within the model. Nevertheless, the model remains subject to review and modification as we continue the study.

In summary, our continuing research indicates that the IDA model appears to meet the original goal of providing a parsimonious approach to capturing adaptability as described by a variety of researchers in the academic world, an approach that would have practical meaning for implementation of learning initiatives within the DoD learning establishment. See Figure 3.

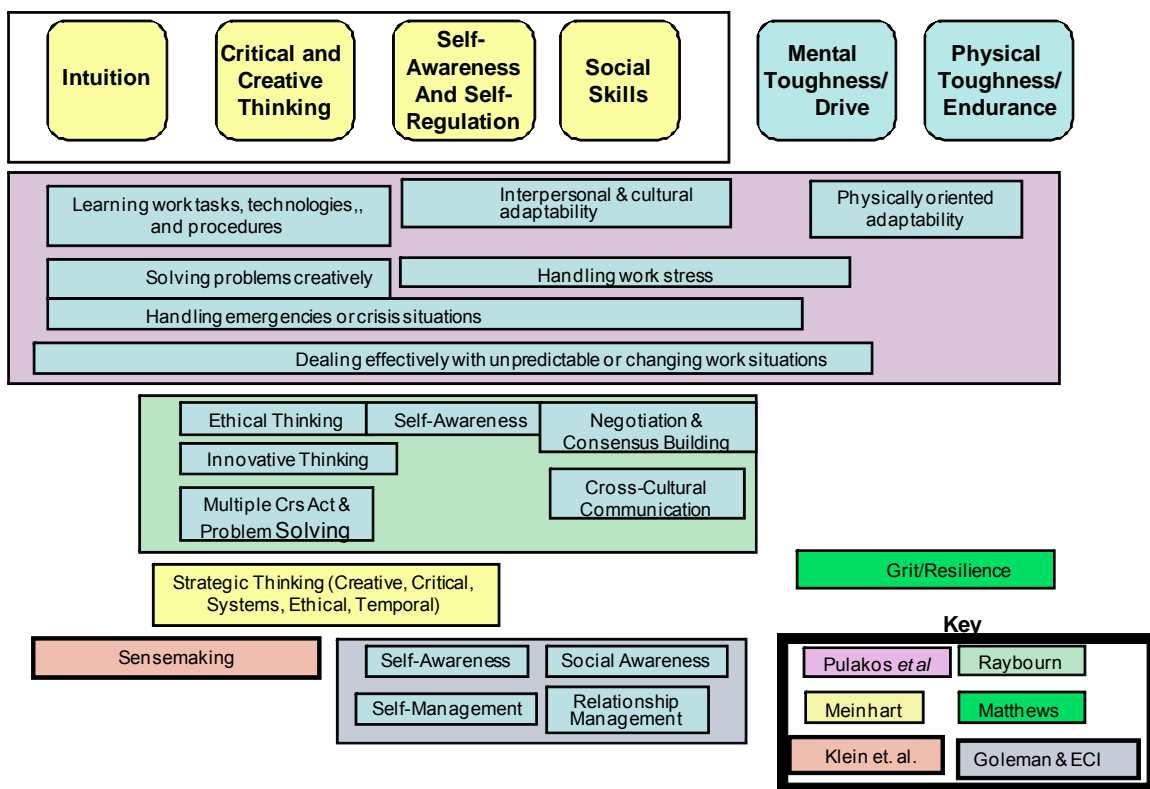


Figure 3. IDA Adaptability Model Mapped to Other Studies/Descriptions

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III. KEY FINDINGS

While our task is to help confirm whether and show how adaptability can be trained, a key finding²⁵ of our research has been that training is only one contributor to adaptability. Adaptability learning is a function of education and experience, as well as training. It is probable that because of the relative amount of time an individual devotes to training, as opposed to time spent in school and self education or to the time that comprises one's overall life experience, and because of the way in which brain functioning affects learning, experience and education are even more influential in enhancing adaptability than is training. Underpinning this idea are theories of experiential learning and adult learning.²⁶ The relative influence of each sphere in nurturing adaptability implies that it is likely that assignment patterns and exposure to opposing views, gray areas, and foreign cultures through liberal education are at least as, if not more important than any purpose-designed adaptability training ever is likely to be. What this suggests is that, to have the desired impact, the portion of the relatively smaller amounts of time spent in training must be intentionally focused, well-structured, and effectively executed. This is particularly true since inculcating specific tactics, techniques and procedures remains as important as ever, but now periodically must be supplemented by training focused on the metaskill of adaptability.

In fact, what we suggest is that the greatest adaptability learning occurs in those situations where adaptability learning in one sphere is reinforced by similar learning in both of the other spheres. An example of such a situation might be a unit's preparation for deployment to a combat zone that included multiple "crucible experience" training events in scenarios reflecting the variety encompassed by the range of military operations in the projected joint operating environment. Ideally, the previous professional military education of many of the officers and NCOs in the unit would have included exposure to the area of deployment and some of them would have actually been there. Successful completion of the exercise would not be based on the achievement of some

²⁵ Our findings are based on presentations and discussions at the Adaptability Symposium 2007, discussions with academics and researchers studying the subject of adaptability, continuing reviews of relevant literature and the vetting of these findings with recognized experts at IDA, in the academic community, and at research organizations.

²⁶ See for example Daniel J. Siegle, *The Developing Mind* (New York: Guilford Press, 1999) and Stanley I. Greenspan and Stuart G. Shanker, *The First Idea* (Cambridge, MA: Perseus Books Group, 2004).

predetermined result, but would rather depend on the effective employment of critical and creative thinking skills enhanced during PME, sound decision making, and the display of a wide range of relational skills, including cross-cultural skills. Skilled trainers would ensure that the individuals, commander/leader teams and units at every level gained a greater sense of the complexity of the environment, the range of solution sets possible and the confidence they needed to be successful as a result of the training. The deployment itself then would become a validation and continuation of the training. A depiction of such a situation is represented by Figure 4, showing the natural overlap between education and training (learning) and the fact that both are a subset of experience in general.

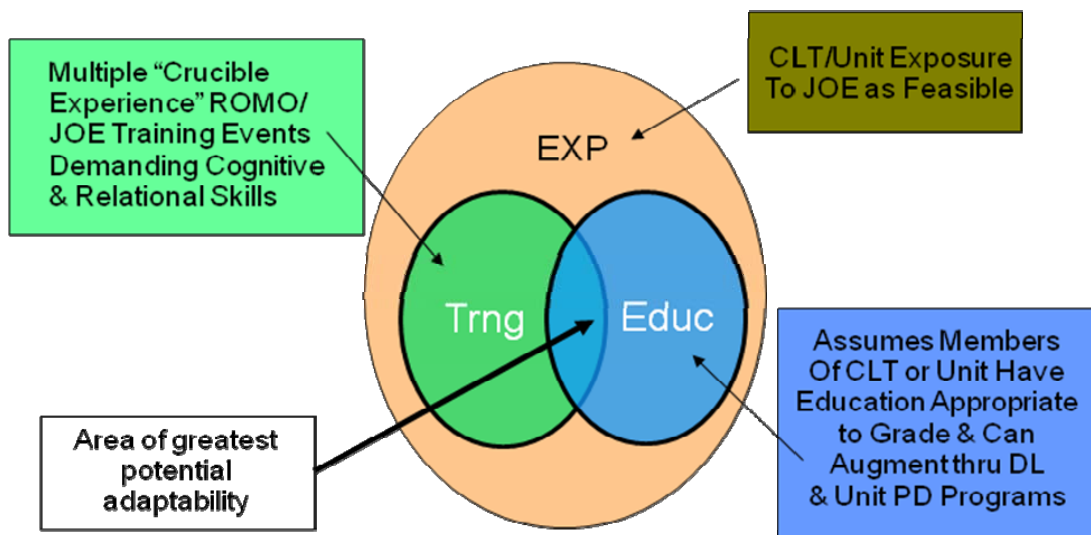


Figure 4. Experience, Education and Training Together Foster Adaptability

An equally important finding has been that adaptability performance is a function of not only the teachable and trainable adaptability skills depicted in the IDA model, but also of individual predispositions and organizational openness. Though neuroscience recognizes adaptability as a core function of the brain and neural systems, not everyone has the same aptitude for the metaskill of adaptability any more than everyone has the same aptitude for language or music. Supportive of this idea, an ARI study identified specific personality traits related to adaptability. Examples are: self-efficacy, resiliency, openness, achievement motivation, tolerance of ambiguity, and a willingness to learn.²⁷ Our underlying hypothesis is not that everyone can reach the same high level of performance with regard to adaptability, but that individuals, leader teams, and units can,

²⁷ Army Research Institute for the Behavioral and Social Sciences, "Training Adaptable Leaders: Lessons from Research and Practice," Research Report 1844, October 2005, pp. 4-5.

through training, become more adaptable than they otherwise would be. At the same time, regardless of individual aptitudes and personalities, the extent to which individuals, teams, or units perform adaptively will be highly influenced by the degree to which the organization in which they are functioning is receptive to critical and creative thinking, is willing to take risks, and is tolerant of mistakes. In other words, a culture of adaptability begets adaptability.

Fundamental to our study has been the finding that a majority within the academic community believes that, while difficult to accomplish, adaptability can be trained, or, perhaps more accurately, that it can be developed. Again, though, we point out that training is only one aspect of the development process. Dr. Stanley Halpin, Chief, Leader Development Research Unit, U.S. Army Research Institute, offered this cautionary observation during the IDA hosted Adaptability Symposium in 2007:

General developmental principle: complex behaviors like adaptability are not well suited to a training solution. Need an educational setting with competent instructors who themselves get it, who can provide feedback/guidance/mentorship across many repetitions. In-unit learning can also be effective if there is a culture of openness and willingness to learn, plus honest AAR's [after action reviews] and competent mentor.²⁸

Though we would describe adaptability as a metaskill manifested in behavior, we agree with Dr. Halpin's description of what is required to train adaptability. A traditional training venue, focused on training tasks to a specific standard, will require enhancement in the form of adaptable scenarios, an educational element, and instructors prepared both to challenge those being trained as well as to assist them in understanding how to respond to novel situations.

While we share the view that adaptability can be developed, we have found no scientifically acceptable metrics, in the military or other domains, which would validate current efforts to train or develop adaptability. Thus, to this point, there is no consensus on how to train adaptability, particularly within the world of behavioral and social scientists who have been most engaged in pursuing adaptability development.

A point of general agreement is that there can be no such thing as an adaptability "inoculation." One cannot take a short course on adaptability or go through one series of adaptability exercises in order to achieve adaptability. As observed by a noted industrial-organizational psychologist: "Developing adaptive capabilities entails a long-term

²⁸ Stanley Halpin, slide notes on slide developed to illustrate Dr. Halpin's General Adaptability Model during adaptability Symposium 2007, December 2007. Appendix D.

process that provides trainees with extensive guided experience.”²⁹ One can only become progressively more adaptable, and becoming more adaptable requires broad experience, continuing education, and training at every level and in every relevant operational venue. Education, training, and experience that would make a young leader more adaptable in a tactical, small unit situation would need to be built upon and continually reinforced in order to make that same leader more adaptable as a senior officer facing operational or strategic challenges.

It is perhaps worth emphasizing that, without changing the components of adaptability, the IDA model identifies different levels of adaptation and recognizes that adaptability at different levels of an organization emphasizes the components in different ways. We have frequently found that when adaptability is discussed it is conceived of as a tactical skill—the ability of a young officer or NCO to react to a novel situation under stressful and time-sensitive conditions. This is clearly one venue where adaptability is required, and in this case, intuition may be the dominant component exercised. However, adaptability is just as necessary at much higher levels and in situations where more time is available in which to respond to a changed situation, more extensive critical and creative thinking is required to develop an effective response, and more complex relational skills are required in order to carry out an effective response. At the operational level, conditions in a theater may require adapting a campaign plan. Clearly that was the situation confronting General David Petraeus’ as he prepared to assume command of the war in Iraq. At an even higher level, changes in the overall security environment may call for a change in strategy and force structure. There is no better example of this than the need to adapt to the demise of the Soviet Union or to the advent of what is being called the Global War on Terrorism (GWOT) or the Long War. There are, indeed, various levels of adaptation within the military domain. The IDA model calls for continually developing the metaskill of adaptability throughout a career and at every level of military organization.

Another idea with regard to adaptability that has broad consensus is that adaptability must be considered in the context of a particular set of basic skills. One may be adaptable as a jazz musician, but that would not make him adaptable as a surgeon or

²⁹ S. W. J. Kozlowski, “Training and Developing Adaptive Teams: Theory, Principles, and Research” in *Making Decisions Under Stress: Implications for Individual and Team Training*, ed. J. A. Cannon-Bowers and E. Salas, (Washington, DC: American Psychological Association, 1998), p. 120.

pilot. In other words, adaptability is “domain specific.”³⁰ The military domain, in the broadest sense, is the range of military operations (ROMO)³¹ in the joint operating environment (JOE).³² In other words, in order to become more adaptable, military individuals, leader teams, and units, must develop basic professional skills and then learn to apply them effectively in operations ranging from high intensity conflict to counterinsurgency operations to humanitarian assistance, while operating in an environment characterized by globalization, unpredictability, and asymmetric threats to security.

Proponents of Guided Experiential Learning (GEL) express well the idea that one must be grounded in the basics of a domain in order to become adaptable in that domain:

Our view is that most training systems focus primarily on the learning of conceptual knowledge (concepts, facts, processes and principles) and not on learning “how” to solve problems and handle complex, real world scenarios. Clark and Feldon discuss this issue in depth in a review of current research on complex learning. Current training and Field Manuals describe systems and suggest “what to do” in some situation and expect that trainees will figure out “how” to perform when in the field (often while they are handling extremely volatile, uncertain, complex and ambiguous situations). Some training methods, such as those used in clinical medicine, provide expert-led demonstrations and require practice and feedback. Learning how to apply knowledge flexibly in authentic situations requires that trainees first learn how to handle routine situations and only then tackle complex scenarios and solve complex problems. Once trainees have learned at least one way to handle a scenario or solve a problem they can begin to learn how to flexibly apply that way to handle novel and unexpected events.³³

Conversely:

Current evidence best supports the claim that when training systems provide novice to intermediate trainees with many different approaches to solving problems or handling a complex scenario - or require them to construct their own approaches, the most common effect is cognitive overload and a failure to learn.³⁴

In other words, to become adaptive across the domain of the ROMO requires traditional training in the fundamentals of military tactics techniques and procedures, but training

³⁰ Army Research Institute for the Behavioral and Social Sciences, *Training Adaptable Leaders: Lessons from Research and Practice*, Research Report 1844, October 2005, p. 7.

³¹ See *Capstone Concept for Joint Operations*, v 2.0 p. 10 at http://www.dtic.mil/futurejointwarfare/concepts/approved_ccjov2.pdf.

³² See US Joint Forces Command, *Joint Operating Environment: Trends and Challenges for the Future Joint Force Through 2030*, December 2007.

³³ R. E. Clark and D. F. Feldon, *GEL, Adaptable Expertise and Transfer of Training*. Report produced under contract sponsored by the U.S. Army Research, Development, and Engineering Command (RDECOM), (September 9, 2008), pp. 4-5.

³⁴ *Ibid.*, p. 5.

that is ultimately carried out in progressively more complex scenarios. Training cannot begin with complex scenarios, but training adaptability requires progressing to complex scenarios. A novice in the ROMO domain, inexperienced in fundamental skills of the domain and confronted with a novel and complex situation in that domain, would in most cases be unable to produce an effective response because of the cognitive overload resulting from the challenge.

Because adaptability is domain specific, adaptability training must be tailored to specific audience requirements. Adaptability training for the military must be conducted in the context of the ROMO, but it must also take into account the basic professional skills of the training audience and the environment in which they operate. This means recognizing the roles and missions of the Services. Adaptability training for the Army and Marine Corps will not be the same as for the Navy or Air Force, although it will be based on the same principles. Similarly, adaptability training at the tactical level will be different from adaptability training at the operational and strategic level of war.

A finding that raises particular challenges has been the idea that job-required adaptability profiles vary significantly.³⁵ Adaptability is not equally essential to all individuals and units. Special Operations Forces are required to be particularly adaptable, and that is why the Army's one major effort at training adaptability was undertaken at the Army's Special Warfare Center and School. Individuals in other occupational fields that tend to rely more on standardized procedures and routines will probably require less adaptability training. Those working as aircraft mechanics or nuclear reactor operators are probably good examples of the latter. This finding raises a challenge, because it implies the difficulty of introducing adaptability training throughout DoD and the need to identify where scarce training resources can best be applied, especially in the near term.

A perverse corollary to the idea that not everyone benefits equally from adaptability training has been our finding that some leaders feel that no one would derive significant benefit from purpose-designed adaptability training, at least not enough to justify the effort. While our original study showed that the DoD leadership recognized the critical importance of developing adaptable leaders,³⁶ there is no consensus across the Services, particularly in the more senior ranks, with regard to the need to develop

³⁵ E.D. Pulakos, S. Arad, M.A. Donovan, and K.E. Plamondon, "Adaptability in the Workplace: Development of a Taxonomy of Adaptive Performance," *Journal of Applied Psychology* 85, no. 4 (August 2000): 612-624.

³⁶ John Tillson, *Learning to Adapt to Asymmetric Threats*, brief presented at Joint Training and Simulation Conference, October 2005.

individuals, leader teams, and units that are more adaptable than they already are. Many leaders are of the opinion that they and those with whom they work are as adaptable as they need to be, that a normal career pattern, with traditional training, produces sufficient adaptability; and, therefore, there is no need to be concerned with developing greater adaptability. Specifically, they consider that though there is currently no purpose-designed adaptability training, existing training suffices to develop adaptability as a by-product. Therefore, from this perspective the question no longer is who should receive adaptability training and how should the training be accomplished, but why devote scarce resources to purpose-designed adaptability training for anyone?

While there is a consensus among the experts that the functional adaptability³⁷ required to contend with a complex operational environment is domain specific, there is also broad agreement that certain elements of adaptability probably have universal applicability. In particular, self-awareness, some relational skills, and habits of critical thinking appear to be relevant in every domain. On the other hand, intuition, which is defined as the way we translate our experience into action, is clearly domain dependent. Experience that allows one to make judgments and decisions in one domain will not necessarily be relevant in another domain.

We repeatedly found expression of the idea that an essential component of adaptability training is the incorporation of talented and qualified instructors, coaches, and mentors. Dr. Halpin's comments above were only one such example of this. Adaptability training and education require the dedicated efforts of people who are professionally competent, who understand the complexities of adaptability, and who believe in what they are doing. Adaptability training, by its very nature, is not rote instruction to be carried out by personnel deemed available to be diverted from the more important "real work" of the military. Preparing military personnel to adapt to the unpredictable nature of operations that characterizes the current operating environment requires the talents of adaptive leaders with proven relevant performance, who themselves are competitive for promotion and assignment to positions that demand the capacity to respond effectively to change.

To summarize these key findings: Training is only one aspect of adaptability learning. Training and education are part of a process of spiral development, but the robustness of that spiral is entirely dependent upon the real-world experience of those being trained. A narrow career path will constrain what can be learned in a training and

³⁷ Functional adaptability links the four IDA components to performance or action.

education environment because the foundation for learning will be limited. Therefore, to be effective, adaptability training must be built upon and reinforced over an entire career, must expose those being trained to the range of operations they may experience, must take into account the culture and core competencies of the training audience, and must be supported by a competent and adaptive cadre of instructors and educators.

Leaving aside the position of those who see insufficient marginal return in purpose-designed adaptability training, our findings indicate the best approach to adaptability training would be along two parallel paths. Training adaptability requires, among other things, variety and repetition. Therefore the first approach would be periodic exposure to multiple comprehensive “crucible experience”³⁸ events that take people out of their “comfort zones.” These training events would be designed to enhance individual, team, and unit capacity with regard to all four components of the IDA model of adaptability. Exposure to such training should occur at each stage of an individual’s career and as a dedicated phase of the training cycle for deploying units and staffs. The key to developing adaptable leaders at every level is repeated exposure to “crucible experiences” that are commensurate with a leader’s operational environment and level of responsibility—the more senior people become, the greater the demands on them and, thus, the more demanding the training they require.

The second parallel approach would involve the intentional insertion of more variety into routine training. The aim would be not only to develop and refine specific professional skills, but to practice those skills in a variety of challenging and stressful situations. Routine training will not necessarily accommodate all four components of the IDA model of adaptability, but the goal should be to interject one or more of those components into the training where it can profitably be done. Adaptability requires using skills one has to respond effectively to a changed situation. Therefore, the greatest value will be gained from training fundamental skills when those being trained are able to progress to the point that they can use their skills in a variety of novel and complex scenarios.

While we have focused on training, we reiterate that both of these approaches to training must be complemented by adaptability education. Critical thinking skills, communication skills, cultural understanding and awareness, understanding of human behavior, and knowledge of government, world affairs and advances in science and technology are all essential to the development of adaptable individuals and teams. The

³⁸ Crucible experience is discussed in more detail later in the paper.

military can provide this education at the Service Academies and through professional military education (PME) throughout a career. Education and training should be mutually reinforcing. The Adaptive Thinking Leader (ATL) course taught at the Army's Special Warfare Center and School, with its cadre of military personnel and academic specialists and a blend of classroom education and field training, is an excellent example of the blending of training and education.

Finally, a key finding of our study has been that establishing purpose-designed adaptability learning, including training, in DoD will require a long-term effort. What our research suggests is needed is not easy, and to sustain the long-term effort will require a succession of senior leaders who value the development of adaptability—who consider it not only relevant and doable, but necessary. We believe that with the current focus on the issue, the idea of developing adaptability can be firmly planted and pilot efforts initiated in the near- to mid-term.

However, sustaining the concept, refining methods of adaptability development, building delivery instruments, and gaining enduring support will require a generation and the commitment of sufficient resources. Particularly significant will be the requirement for a parallel change in Service cultures, reflected in broadened experience patterns, new approaches to professional military education, and more openness in commander/leader team problem solving. Within the new culture, adaptability must be accepted as the cumulative result of experience, education and training, but not an automatic result. There must be an understanding that improved adaptability commensurate with the demands of a constantly and rapidly changing security environment requires purposeful interventions in every area that impacts on personnel development.

The development of greater adaptability must be understood as a long-term investment, and, without a sustained commitment to that investment, adaptable performance will continue to be problematic—at best, a matter of chance in an environment characterized by the increasing pace of change. With a sustained commitment, leaders a generation from now will be prepared to respond more adaptively at every level—tactical, operational, and strategic; and the greatest return on investment will be the ability of the most senior leaders to make effective strategic decisions in a world that they as junior leaders today cannot imagine.

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IV. RESULTS OF DETAILED SURVEY OF ADAPTABILITY TRAINING

A. SUMMARY

Since the original IDA study, “Learning to Adapt to Asymmetric Threats,” the Services and Joint organizations have made modest advances in adaptability-related learning. Our survey identified where components of adaptability were introduced into some training and leadership programs and where additional efforts to develop adaptability exist—especially in the Army. However, we found no comprehensive purpose-designed adaptability training, with the exception of the Army’s Adaptive Thinking Leader (ATL) course at the John F. Kennedy Special Warfare Center and School and possibly the Adaptive Leader Methodology (ALM) employed to varying degrees in the Army’s Basic Officer Leadership Courses (BOLC II).

We found broad agreement that metrics which would indicate whether any particular intervention contributes to adaptability learning have yet to be developed.³⁹ There are anecdotal accounts which tend to support the effectiveness of specific training programs, but they do not meet the requirements for reliability, validity, and precision that are associated with metrics acceptable to the scientific community. The only example of solid metrics found is in the “Think Like a Commander” (TLaC) training module used in the Captains’ Career Course at Fort Knox, but the module itself covers only limited aspects of adaptability learning.⁴⁰ Our findings support the contention that it would, in fact, be possible to develop suitable metrics, but the process of doing so will be challenging. In fact, initially, it may be necessary to focus on metrics for the separate components of adaptability.

Based on our survey, we concluded that there is currently no purpose-designed and validated adaptability training in DoD. Accordingly, it would be of overarching value to this effort to design and conduct an experiment to test the hypothesis that

³⁹ One reviewer commented: “Adaptability defined as a skill set within a specific context is already being studied and metrics have been developed that measure adaptability within this body of literature.” Patricia Romano McGraw, review of *Developing an Adaptability Training Strategy and Policy for the DoD* (draft), IDA Paper P-4359, Institute for Defense Analyses, August 15, 2008. As we continue this study, we will investigate Dr. McGraw’s comment, particularly to the extent that it reveals the effectiveness of a particular training intervention designed to increase adaptability.

⁴⁰ See Appendix E.

adaptability can be trained in an intentional manner. An essential component of such an experiment would be reliable and valid metrics that permit verification of training effectiveness.

B. ARMY

During the Adaptability Symposium at IDA in December 2007, the Army presented eight briefings. Four of them reported efforts focusing directly on adaptability. One of those addressed extensive Army Research Institute adaptability research:

- Adaptability: Research Concepts and Findings. Dr. Stanley Halpin, ARI,

The other three addressed adaptability-focused pilot efforts:

- Adaptive Leaders Methodology (Applied). LTC Max Padilla (ret) & MAJ Don Vandergriff (ret), USA Accessions Command
- Non-Cognitive Predictors of Soldier Adaptability and Performance. Dr. Michael D. Matthews, USMA
- Combat Application Training Course. William M. Darwin, Asymmetric Warfare Group

Three briefings addressed specific venues where the Army believes training and education contributing to adaptability is being conducted, although adaptability is not a direct focus of the learning programs.

- DoD Adaptability Initiatives. COL Gary R. Hisle, Jr., Combined Arms Center
- Adaptability Learning: Instructional Development Revision and Problem-Based Learning. Dr. Bob Bauer, US Army Armor Center
- Strategic Thinking within the Context of Adaptability. Dr. Richard Meinhart, Army War College

And one addressed a module added to the Special Warfare Center and School's Adaptive Thinking Leader (ATL) course:

- Training System Approaches for Honing Adaptive Thinking, Cultural Awareness and Metacognitive Agility. Dr. Elaine M. Raybourn, Sandia National Laboratories

The Army briefings included a description of extensive research on the theory of adaptability and how adaptive, or mentally agile, leaders perform. They reflected a specific focus on developing adaptive performance that was unique among the Services. Examples of research projects designed to enhance adaptability or the components of

adaptability included: programs for training critical thinking; an instructional tool for developing interpersonal skills and intercultural awareness; an adaptive thinking and leadership module inserted into special forces training; a program of theme-based or problem-based training, including crisis action planning and execution; and a prototype for enabling command leader team adaptability. A brief by Professor Michael Matthews of West Point highlighted the importance of character development as it relates to adaptability, particularly those aspects of character reflected in perseverance and the passionate pursuit of long-term goals.

Among Army pilot efforts, the Adaptive Leader Methodology (ALM) originated by Major Don Vandergriff (ret.) while teaching ROTC at Georgetown University illustrates the critical role played by instructors and mentors in developing adaptability. A pilot course of the Asymmetric Warfare Group, The Combat Application Training Course (CATC), provides a teaching and training methodology wherein military skills are presented as integral to a relevant problem solving exercise, thereby enhancing critical and creative thinking skills. CATC is designed to develop the intangible attributes of confidence, accountability, and initiative; teach through contextual understanding of the task and its mission application; condition soldiers to exercise a deliberate thought process while under stress; and condition soldiers to overcome the psychological and physiological effects of combat. All these goals correspond to components of the IDA model. Related to this and of particular interest to our study, an analysis by the U.S. Army Armor Center compared extant learning models to Bloom's Taxonomy of Educational Objectives. This analysis demonstrated why a problem-based learning model seems most suited to the development of the highest learning objectives, which include those associated with adaptability.

Finally, several briefings showed that existing Army courses lend themselves to specific aspects of adaptability learning. Courses within the Command and General Staff College invite critical thinking and, when using specific teaching methodologies, promote the development of self-awareness and interpersonal skills. In a more intentional way, the Army War College introduces a strategic thinking framework, which includes critical and creative thinking, at the beginning of the course and then applies this framework throughout the academic year.

Each of the briefings reflected a high level of sophisticated and valuable research or described effective training and education that is ongoing. Of particular note though, much of what the Army offered as "adaptability" training, is application of lessons learned from operations. While extremely useful, particularly in terms of developing

domain-specific experience, this training is not in itself sufficient to develop the metaskill of adaptability defined by the IDA model. In total, the briefings indicated that the Army is committed to training adaptability and wants to learn how to do it. At the same time, with regard to training adaptability specifically, existing programs are ad hoc, stand alone efforts, rather than purpose-designed, comprehensive programs of instruction (POI). However, the Army may well provide the best venue for experimentation, based on the work of ARI to date, the Army's strong desire to improve in this area, and official expressed interest.⁴¹

C. NAVY

During the December Adaptability Symposium, Navy representatives made six presentations. The briefings described five specific venues in which the Navy believes that adaptability or a component of adaptability is being trained or taught:

- Battle Stations 21: The Future of Navy Performance. Rodney A. Chapman, Naval Service Training Command
- Adaptability Training in Computer Network Operations (CNO). CTNCS(SW/SS) Christopher J. Dunford, Center for Information Dominance
- Adaptability Training in Naval Intelligence. Dr. Bud Livers, Center for Naval Intelligence
- Adaptability Training. Mr. Robert Taylor, Navy Expeditionary Combat Command
- Critical Thinking @ USNA. Dean Michael C. Halbig and CAPT Robert J. Niewoehner, USNA

and one initiative designed to enhance adaptability on a service-wide basis:

- Adaptability, Self-Awareness, & Organizational Analysis. CDR James S. Pfautz, Center for Naval Leadership

At each of the venues discussed, there were, in fact, training and the employment of training methodologies that would contribute to the various components of adaptability: Battle Stations 21—a variety of scenarios, a requirement for teamwork, and real-time critiques; Computer Network Operations at the Center for Information Dominance—scenarios that can be modified by instructors, pitting students against each other in battle labs, and the use of “adversary networks;” Center for Naval Intelligence—an intelligence team trainer and increasingly complex scenarios; Naval Expeditionary

⁴¹ Expressed by BG Thomas C. Maffey DCS, G-3/7, Director of Training, HQDA, when briefed on the results of this study on March 24, 2008. He indicated strong support for the study and an experiment.

Combat Command—scenario-based training and cultural and language training; and the U.S. Naval Academy—a renewed commitment to developing critical thinking.

The initiative of the Center for Naval Leadership is aimed at developing an automated 360-degree evaluation program⁴² that will serve the dual purpose of developing greater individual self-awareness and providing predictive analytics and causative data that will contribute to improving operational readiness. The attractiveness of automating the program is the significant reduction in cost that results from eliminating the personalized individual feedback and counseling, which is a major cost in other 360 programs.⁴³

Though not presented, the Navy also employs 360 evaluations in courses provided to senior officers and civilians through the Office of the Executive Learning Officer. These courses also focus on strategic planning and have the potential, through the development of strategic thinking, to contribute to the development of adaptability.⁴⁴

The Navy did not brief the TADMUS (Tactical Decision Making Under Stress) program that it carried out throughout the 1990's, following the shootdown of an Iranian Airbus by the USS Vincennes in 1988.⁴⁵ However, the decision-making processes developed in the course of that study, which included attention to critical thinking and team performance, if coupled with a 360 program to enhance self-awareness, could conceivably form the basis for a comprehensive adaptability program of instruction.

The bottom line at this point, however, is that the Navy, while presenting a number of excellent training programs that likely contribute to adaptability as a by-product of the training, has no purpose-designed adaptability training; and, unlike the Army, has not shown a particular interest in developing training programs focused on that specific capability.

⁴² As opposed to the traditional method of having an individual evaluated only by a single senior supervisor, the 360-degree evaluation process relies on multiple sources for evaluation input, including one's peers, subordinates, seniors, and even those with whom one works outside of the chain of command.

⁴³ However we recognize that there is also a contrary view that personal one-on-one counseling by trained mentors is essential. Negative feed back without explanation or suggestions on how to improve relational skills could otherwise be debilitating.

⁴⁴ Meeting with Frank Petho, Navy Office of the Executive Learning Officer, January 14, 2008.

⁴⁵ Janis A. Cannon-Bowers and Eduardo Salas, ed., *Making Decisions Under Stress: Implications for Individual and Team Training*, Washington, DC, American Psychological Association, 1988.

D. MARINES

During the same December symposium, the Marines presented four briefings. The first described the Marine Corps philosophy and highlighted the “Crucible” which is the culmination of Boot Camp.

- Adaptability Training or “Marine Corps Philosophy on Warfighting.” LtCol Travis A. Tebbe, USMC Training and Education Command (TECOM)

The second two briefings described training provided for Marine Air Ground Task Force (MAGTAF) operations, combined arms training, and unit readiness planning at the battalion and regiment levels, as well as existing tactical decision-making simulations and current experimentation designed to enhance future training.

- Marine Corps Tactics & Operations Group (MCTOG). LtCol Timothy E. Barrick, MCTOG
- Simulation to Develop Adaptable Marine Leaders. Mr. Donald J. Mathes, TECOM Technology Division

The final Marine brief discussed relevant educational methodologies and curricula improvements since 2005.

- Marine Corps University: Educating Adaptable Leaders for an Unpredictable Future. LtCol Jay L. Hatton, Command and Staff College, and Dr. Wray R. Johnson, School of Advanced Warfighting

Philosophically, the Marines consider that their training has always been geared toward developing adaptability. Various aspects of the Corps’ training does, in fact, develop components of adaptability in the IDA model. The Marines’ “Crucible” experience, which dates to 1996, is designed to foster creative thinking, self-awareness, and team-building. Predeployment training is designed to prepare Marines to coordinate with, support and leverage the various joint and interagency assets and organizations that will be with them on the battlefield. A number of simulations being employed by the Marines build on the tactical decision making games that they have used effectively for many years. Current simulations permit scenarios to be created and modified in real time, provide competition against other players or a computer-directed enemy, and produce after action reviews. Ongoing experimentation with simulations includes efforts to develop scenarios for live exercises, to manage role players and scenarios, and to derive the social and cultural model and expected behaviors of real people or factions in a unit’s area of responsibility. Students at the Marine Corps University participate in lessons, seminars, and exercises in critical thinking and study foreign cultures, employing a systematic approach based on five dimensions of operating culture.

Though not briefed, the new Infantry Immersion Trainer (ITT) at Camp Pendleton may teach tactical adaptability. “The trainer is a current demonstration, test and evaluation facility to refine immersive simulation requirements while at the same time providing...training for deploying combat units.”⁴⁶ In a study of the effectiveness of the ITT based on feedback from deployed Marines, Pacific Science and Engineering Group reported “...it is clear that, in the opinion of Marines, the IIT has significant training value that is unmatched by other training opportunities and facilities.”⁴⁷ Of particular interest, the technology used in the immersion trainer, specifically that developed by the Institute for Creative Technology, appears to have potential for training adaptability in other venues. Also not briefed, the major exercise Mohave Viper at 29 Palms provides excellent lessons learned training, which is a common feature of training in each of the Services. That exercise and other training that was briefed may well enhance adaptability, though that is not a specific design purpose of the training.

We have found that whereas the Marines are not specifically focused on developing purpose-designed adaptability training, they believe they are already doing it, and they would readily accept any adaptability training methods shown to be effective. The Marines also would likely be willing to support experimentation if value added appears apparent and the effort is joint.

E. AIR FORCE

The Air Force presented only one briefing at the Adaptability Symposium:

- OSD Adaptability Learning Symposium: Air Force. Dr. Patricia F. McGill, Headquarters USAF (AF/A1DI)

The brief highlighted the fact that Air Force Institutional Competencies, supported by a continuum of learning, include competencies essential to adaptability. The brief went on to provide an extensive overview of Air Force training. It was based on a survey that employed an excellent methodology for assessing whether adaptability was, in fact, the objective of a particular type of training or education. The survey indicated that 104 courses were self-identified as teaching or training adaptability. The brief focused on fifteen courses or venues considered to be particularly relevant in developing adaptability, including the Air Force Academy and Air War College. The brief concluded that the Air Force teaches adaptability in all Professional Military

⁴⁶ Dr. Randall W. Hill, Jr., Institute for Creative Technologies, e-mail, June 4, 2008.

⁴⁷ Erica. D. Palmer, Jason M. Kobus, and David A Kobus, “Infantry Immersion Trainer (IIT): feedback from Recently Deployed Marines,” Pacific Science & Engineering Group, Inc., February 2008, p. ii.

Education venues. However, it also concluded that if adaptability training is identified by OSD as a requirement, that requirement would have to be balanced with other OSD requirements, implying that it is not a specific focus of training and education at this time. The brief also pointed up the Air Force's emphasis on technical training, stating that technical training insures airmen have the skills they need. Once again, our conclusion is that a number of Air Force courses may contribute to developing components of adaptability, but the Air Force has no comprehensive training specifically designed to develop the metaskill of adaptability portrayed by the IDA model.

F. JOINT PROFESSIONAL MILITARY EDUCATION AND TRAINING

No joint commands were represented with the Services at the December 2007 symposium. However, we conducted follow-up research to determine the current extent of adaptability training in the joint arena. We determined through contact with JFCOM J-7⁴⁸ that adaptability is not a particular focus of the training conducted by Joint Forces Command. In the Joint Professional Military Education (JPME) environment, we found⁴⁹ the curriculum of the Industrial College of the Armed Forces (ICAF) to have the most direct relationship to the development of adaptability. In particular, students take a required course, Strategic Leadership, which includes a specific focus on critical and creative thinking and the development of interpersonal skills. The school also offers an elective, Critical, Creative, and Reflective Thinking, and it addresses critical thinking, creative thinking, systems thinking and reframing in specific core curriculum lessons.⁵⁰ The School's Executive Assessment and Development Program provides a 360 assessment to enhance self-awareness. The National War College employed the latter program for the first time during the past academic year. As in our earlier study, we confirmed that the Joint National Training Capability (JNTC), the Joint Knowledge Development and Distribution Capability (JKDDC), and Joint Knowledge Online (JKO) have the potential for supporting adaptability training. However, they are simply technological tools that require content—in this case, adaptability training scenarios, exercises, or lessons—in order to become useful for adaptability education and training. As with the individual military Services, we concluded that there is no purposed-designed adaptability training or education provided in the joint world.

⁴⁸ Telecon with Mr. Greg Knapp (JFCOM J7) February 14, 2008 and Col. Ulysses Brown (JFCOM J7) 20 February 2008. Confirmed by CAPT Chuck Melcher, during JWFC Training Conference, June 13, 2008.

⁴⁹ Meetings at the National Defense University (hosted by Provost Susan Studds) February 6, 2008 and at the Industrial College of the Armed Forces (hosted by Dr. James Browning) February 28, 2008.

⁵⁰ Dr. Mark McGuire, Industrial College of the Armed Forces, e-mail, June 5, 2008.

G. OTHER ADAPTABILITY INITIATIVES

Our research beyond the military services included efforts to identify adaptability-related training and research being conducted in other government agencies (OGAs), in private industry and academia, and by selected foreign militaries. As with the U.S. Military, we found instances in each of these sectors where certain aspects of the IDA adaptability model are being addressed; but we found no purpose-designed adaptability training.

1. Other Government Agencies

We found among other government agencies that the intelligence agencies are proactive in efforts to develop one particular component of adaptability, that of critical thinking. These efforts have been greatly influenced by the work of David T. Moore at the National Security Agency (NSA), who teaches critical thinking there and has published a lengthy paper on the subject.⁵¹ NSA offers a course in critical thinking to its analysts, and the Defense Intelligence Agency (DIA) has mandatory entry level analytical courses ...which include Critical Thinking Structured Analysis (CTSA).⁵² The Central Intelligence Agency (CIA) is also working to improve the critical thinking skills of its analysts, with the assistance of IDA.⁵³ The current CIA efforts follow a long series of attempts to “apply higher levels of critical thinking” [to] “substantially improve analysis on complex issues on which information is incomplete, ambiguous, and often deliberately distorted. Key examples of such intellectual devices include techniques for structuring information, challenging assumptions, and exploring alternative interpretations.”⁵⁴

2. Private Industry and Academia

The Interservice/Industry Training, Simulation, & Education (I/ITSEC) Conference in November 2007 provided excellent insight into existing simulations and training methodologies that might have applications relevant to adaptability training.⁵⁵ It is clear that there does exist a robust capability for simulation or serious game support of purpose-designed adaptability training; however, we found no existing simulations or

⁵¹ David T. Moore, *Critical Thinking and Intelligence Analysis*, Occasional Paper 14, Washington, DC: Joint Military College Intelligence Press, May 2006.

⁵² Matthew T. Peters, Defense Intelligence Agency (DIA), Chief, Office of Learning & Career Development, e-mail, June 9, 2008.

⁵³ Conversation with Dr. Franklin Moses, Institute for Defense Analyses, June 3, 2008.

⁵⁴ Richards J. Heuer, Jr., *Psychology of Intelligence Analysis*, Center for the Study of Intelligence, CIA, 1999, pp. xx-xxi.

⁵⁵ See Interservice/Industry Training, Simulation & Education Conference, Published Program, National Training and Simulation Association, November 26-29, 2007.

serious games that had been created to accomplish such training. For example, in a subsequent follow-up visit to Lockheed Martin, we took an in-depth look at the simulation, Combat Leader Environment (CLE).⁵⁶ If the library of scenarios that now exists were expanded, we believe CLE, as part of a comprehensive module, has the potential for delivering effective adaptability training. The Army had planned to introduce the course in its Cavalry Leaders Course at Fort Knox in June of this year, but that has been put on hold pending recompetition of the Lockheed Martin contract in support of the Knox Battlelab.⁵⁷ The bottom line here is that industry is prepared to supply robust simulation technology support for adaptability training, whenever the military, or anyone else, provides a demand. What is currently missing are the specific scenarios and other content, based on validated research, needed to allow the simulation or other technology to be used for the specific purpose of training adaptability.

An extensive review of work being accomplished in academia and other research-oriented institutions indicates that, whereas there is substantial education and training in leadership dynamics and an abundance of literature expounding the requirements for developing adaptability, there do not exist education and training programs that are specifically designed to develop adaptability and that have metrics which demonstrate their efficacy.

Of particular interest, Personnel Decisions Research Institutes, Inc. (PDRI) conducted a survey of adaptability literature and commercially designed adaptability training programs.⁵⁸ That survey summarizes a rich body of literature dealing with predictors of adaptability, the skills and abilities associated with adaptability, and the principles of training adaptability. The survey found numerous commercial courses that addressed aspects of adaptability, but no course that addressed adaptability in all its dimensions. Quoting a well-respected academic whose research focuses on the development of adaptability, the survey concluded that “The understanding of how to train, develop, and enhance individual and team adaptability is in its infancy.”⁵⁹ Though

⁵⁶ At Appendix F see an Army evaluation of CLE at the Combined Arms Center.

⁵⁷ Rick Lozicki (Lockheed Martin), e-mails, April 21, 2008 and July 1, 2008.

⁵⁸ Susan S. White and David W. Dorsey, *Review of Adaptability Literature and Products*, Personal Decisions Research Institutes, Inc., April 1, 2002. See also, Army Research Institute for the Behavioral and Social Sciences, *Training Adaptable Leaders: Lessons from Research and Practice*, Research Report 1844, October 2005.

⁵⁹ S. W. J. Kozlowski, *Training and Developing Adaptive Teams: Theory, Principles, and Research*. In J. A. Cannon-Bowers and E. Salas (eds.) “Making Decisions Under Stress: Implications for Individual and Team Training,” Washington, DC, American Psychological Association, p. 120.

this survey is slightly dated, we found little in the course of our study that would significantly alter its overall findings and conclusions.

There are numerous leadership and management training organizations⁶⁰ which provide courses focused on agility for industry and government leaders, including military leaders. The PDRI survey, mentioned above, lists some of those courses. Although not focused on adaptability over the range of military of operations, these courses teach and train aspects of the IDA adaptability model. Therefore, we conclude that it is conceivable that one or more of these leadership and management training organizations could develop a purpose-designed adaptability training program.

A unique organization which develops technology with significant potential for training adaptability is the Institute for Creative Technology (ICT). ICT is one of the Army's University Affiliated Research Centers. Located in Marina del Rey, CA, it is affiliated with the University of Southern California. Its mission is to “forge effective leaders by revolutionizing learning with interactive digital media.”⁶¹ It is working to do this by employing Hollywood style simulation techniques to create both compelling synthetic experiences and rapidly reconfigurable training scenarios. “[ICT] has proven the effectiveness of immersive, synthetic training with the Joint Fires and Effects Trainer System (JFETS) at Fort Sill, the Immersive Infantry Trainer (IIT) at Camp Pendleton and its efforts with the Cultural and Cognitive Combat Immersive Trainer (C3IT) system at Fort Benning.”⁶² With its focus on human interactions and emotions and the capability rapidly to reconfigurable training scenarios, ICT appears to be moving in the direction of providing training that is adaptability-related and is both scalable and affordable. With adjustments in content, future scenarios likely could enhance their adaptability component.

Early on in our survey, we posted a request for information on the Fed Biz Ops website, soliciting input from organizations that felt prepared to provide adaptability training that conformed to the IDA model. Klein Associates, Novonics Corporation, and Aptima, Inc. submitted responses which claimed experience in providing training that enhanced performance in the components of adaptability, as defined by IDA. In fact,

⁶⁰ For example, see the Center for Creative Leadership (<http://www.ccl.org/leadership/capabilities/greensboro/index.aspx>) and Motorola University (<http://www.motorola.com/motorolauniversity.jsp>).

⁶¹ Randall W. Hill, Jr., Executive Director, “Overview: Institute for Creative Technologies,” briefing presented at ICT, May 7, 2008.

⁶² Randall Hill, Jr., Kim LeMasters, Matthew Trimmer, Julia Campbell, “Advanced Simulator for Combat Operations and Training (ASCOT),” Institute for Creative Technologies, University of Southern California, February 22, 2008.

Gary Klein has worked at length with the military in developing intuition, an important component of adaptability; and his work provided the basis for many findings and recommendations in our earlier study. Novonics has advanced a critical thinking methodology which "...was developed and validated during several research efforts sponsored by the Department of the Navy to support the Tactical Decision Making Under Stress (TADMUS) program."⁶³ Novonics has applied this methodology in developing the Serious Game "Critical Thinking Training for Navy Leaders"⁶⁴ that trains one of the four major components of the IDA adaptability model.⁶⁵ A particular strength of the Novonics model and its Serious Game are the "...instructional supports...[that]...provide the learner with the opportunities to engage in cognitive activities, such as analysis, interpretation, strategy formation, reflection, etc."⁶⁶ Aptima's expertise is in the area of human-centered engineering. It has developed programs to enhance critical thinking and commander-leader-team adaptability.⁶⁷ A member of Aptima's professional Staff, Dr. Jared Freeman, contributed to the Navy TADMUS program and participated in the Adaptability Symposium 2007 at the Institute for Defense Analyses.

The Center for Creative Leadership (CCL) did not provide a response to our original request but has long provided leadership and management training to senior military leaders. As the result of an initiative on our part, CCL presented to us its programs that it believed would provide the basis for adaptability training.⁶⁸ We also attended a CCL training session on crisis leadership provided to government officials and industry leaders in Baltimore. We anticipate that CCL will continue to show interest in this effort, and believe that the organization has the potential to provide effective adaptability training, especially for more senior personnel.

Particularly important in our findings has been the work of the researchers at Personnel Decisions Research Institutes, Inc. PDRI was responsible for developing the 31/2-day Officer Adaptive Thinking and Leadership Course for Army Special Forces. It

⁶³ Novonics Corporation, "Response to Solicitation Reference Number: IDA (RFI) 001," October 10, 2007.

⁶⁴ <http://www.novonicsttl.com/Cnl.aspx>.

⁶⁵ A related form of immersive learning simulations (ILS) is illustrated by the interactive training video, Gator Six, which WILL Interactive, Inc. developed to prepare Army personnel for situations in Iraq and which aids in developing the critical thinking and decision making skills of young officers. A demonstration of that program is available at <http://www.willinteractive.com/gator-six>. The program is also discussed at: Vargas, Jose Antonio. "A 'Sim' That's Dead Serious: Army Using Interactive Video to Train Officers for Iraq." *Washington Post*, April 13, 2005.

⁶⁶ Novonics Corporation, "Response to Solicitation Reference Number: IDA (RFI) 001," October 10, 2007.

⁶⁷ Aptima, Inc., "Training Adaptability," Response to IDA (RFI) 001, October 15, 2007.

⁶⁸ Center for Creative Leadership, Greensboro, NC, May 16, 2008.

was designed to provide “...tools and strategies for approaching situations that require adaptive performance.”⁶⁹ Implemented in 2004, the course has since been employed in training Army PSYOP and Civil Affairs personnel. The training, developed before the original IDA study, addresses the components of adaptability in the IDA model. PDRI also developed metrics to measure the effectiveness of the training. However, the Army Special Warfare Center and School was satisfied with positive anecdotal feedback on the training and therefore decided not to pursue more rigorous metrics. The PDRI personnel involved in the course development remain engaged with adaptability training and would be a valuable resource for any future efforts in this area.

3. Selected Foreign Militaries

A final area we explored in an effort to identify adaptability training initiatives was that of foreign militaries. Significantly, Lieutenant General Sir John Kiszely, Director of the Defense Academy of the United Kingdom, made a presentation at IDA and published a paper late last year, both of which highlighted the necessity for adaptability training and education. In particular, he observed:

And, as noted earlier, current and likely future operations, particularly those such as counterinsurgency, are characterized by complexity, ambiguity, uncertainty and volatility—all of which add up to unpredictability—and by challenges that are not so much formulaic and mechanistic as conceptual and ‘wicked’. This calls for minds which can not only cope with, but excel in, these circumstances—thus, minds that are agile, flexible, enquiring, imaginative, capable of rigorous analysis and objective critical thinking, minds that can conceptualize and innovate, minds at home with sophistication and nuance (‘interpreting shades of grey’) and minds that have developed understanding, intuition, wisdom, and good judgment.⁷⁰

Kiszely does not underestimate the challenge of developing leaders with these qualities of adaptability. In particular, he recognizes the difficulty in preparing military personnel for the possible range of military operations:

To be effective at both combat and counter-insurgency, the army needs to have sufficient warrior ethos, but not so much that it cannot adapt, otherwise warrior ethos becomes an obstacle to versatility and success. Combining these two cultures is highly problematic.⁷¹

⁶⁹ Army Research Institute for the Behavioral and Social Sciences, “Developing Adaptive Proficiency in Special Forces Officers,” Research Report 1831, February 2005.

⁷⁰ John Kiszely, “Post-Modern Challenges for Modern Warriors,” *The Shrivenham Papers-Number 5*, Defence Academy of the United Kingdom, December 2007, pp. 14-15.

⁷¹ *Ibid.*, p. 10.

As noted by Dr. Fletcher in his review of this paper, implied in Kiszely's discussion of combining combat and counter-insurgency cultures is the apparent and "...notable paradox of military training, which is the need, on one hand, to prepare people to carry out some fairly elaborate procedures automatically, with as little thought as possible in contrast to the need, on the other hand, to apply critical thinking and judgment in everything they do. Adaptability seems to apply to the latter, which flies in the face of much of our military training practice."⁷² However, Kiszely addresses this when he contends that:

The relationship between training and doctrine, on the one hand, and education, on the other is important. All training and doctrine needs to be founded on education. If they are not, the practitioner is liable to lack the versatility and flexibility needed to adapt them to changing circumstances or to extemporize.⁷³

It is the combination of education and training, along with experience, that provides a warfare practitioner adaptability--the ability to recognize a given situation for what it is and the capacity to provide an effective response in that situation. Adaptability requires being able to recognize an altered situation that requires a change in response, but it also requires the ability to recognize when the situation demands committing to well-established means for carrying out a task. Adaptability includes the cognitive skill to recognize that a situation is what was anticipated—unchanged—and the self-regulation skills to commit to the timely application of well-rehearsed tactics, techniques, and procedures when that is precisely what is required. An ARI research report makes clear what adaptability is not:

...the change that is made must be effective. It is not adaptive to make a change that makes it more difficult to reach a goal or takes one further from a desired end-state. To be adaptable, the change that is made must work...[and]...the change must be a response to some shift in the environment. Changing one's behavior in a random or whimsical fashion is not adaptive. Rather adaptation arises from situational and environmental changes.⁷⁴

A failure to adhere to well-trained tactics, techniques, and procedures when they are exactly what are needed does not reflect adaptability.

Kiszely also recognizes the exceptional challenge provided by time constraints associated with efforts to develop adaptability:

Finding the necessary time for intellectual development in an officer's career, and in the over-heated syllabi of many military colleges and schools, will be a

⁷² J. D. Fletcher, Review notes for IDA paper P-4358, Institute for Defense Analyses, August 11, 2008.

⁷³ Kiszely, p. 15.

⁷⁴ Army Research Institute for the Behavioral and Social Sciences, *Developing Adaptive Proficiency in Special Forces Officers*, Research Report 1831, February 2005, p. 2.

considerable practical challenge, particularly at the same time as preparing for large-scale combat operations (which, as has been pointed out, is itself a full-time occupation), and particularly at a time when many armed forces find themselves very heavily committed to current operations.⁷⁵

While acknowledging the challenges of developing adaptable leaders, Kiszely never backs away from the necessity of doing so. He clearly recognizes the value of investing in adaptability training and education, particularly for those destined for senior leadership positions:

Such education, therefore, has a training dimension in that it is preparing practitioners to exercise good judgment in their profession, but not just in their next job or deployment, but over the duration of their career. Thus, its payback should not be judged by the improvement to an individual's immediate performance, but by the value it adds to performance over the course of a career, and in the value added to the organization as a whole over a similar time-span.⁷⁶

If Kiszely has not provided a perfect prescription for how to train adaptability, he has certainly made the case for the necessity of doing so.

a. Israeli and Australian Initiatives

Recent contacts with individuals knowledgeable of the Israeli and Australian militaries uncovered initiatives designed specifically to develop adaptability.⁷⁷ The U.S. Army has adopted the Israeli example, in modified form, and is in the process of implementing it. The Australian initiative may well provide useful examples and lessons for the U.S. military, and we intend to continue what appears to be a mutually beneficial dialogue with the Australians.

Israeli Systemic Operational Design and U. S. Army Commander's Appreciation and Campaign Design

Systemic Operational Design (SOD) was developed in Israel and actually taught to senior officers using the case study/scenario method for about ten years before being discontinued in 2005.⁷⁸ The US Army studied SOD and adopted its essence, which is an adaptive approach to dealing with wicked problems. The U.S. Army experimented with SOD during its last four Unified Quest (UQ) war games and, in January 2008, published

⁷⁵ Ibid., p. 19.

⁷⁶ Ibid., p. 15.

⁷⁷ Discussions with Shimon Naveh (Israel) and Lieutenant Colonel P.J. B. Sowry (Australia) during annual U.S. Army wargame, Carlisle, PA, May 1-9, 2008. There was follow-up in both cases by documentary examples of Adaptive Campaigning and SOD.

⁷⁸ Shimon Naveh, "Operational Art and the IDF: A Critical Study of a Command Culture," Center for Strategic and Budgetary Assessment (CSBA), September 30, 2007.

TRADOC Pam 525-5-500,⁷⁹ which essentially is the U.S. version of SOD, Army Commander's Appreciation and Campaign Design (CACD). Following UQ 08, the TRADOC commander, Gen Wallace, directed CACD be taught in the School of Advanced Military Studies (SAMS) course and at Carlisle. While CACD currently is being looked at only as a front end supplement to the Military Decision Making Process (MDMP), it may have broader application in adaptability training.

Australia

The Australian Army has embraced the need for adaptability and is designing its approach to land warfare around the notion of "Adaptive Campaigning."⁸⁰ This approach will impact their culture, force structure, equipment, as well as training. The details of how they intend to change training are yet to be determined, and they are interested in our study and are sharing their ideas on how to move forward.⁸¹ Just recently, the Australian Army conducted a small two-day experiment involving eight officers, which was an initial attempt to demonstrate that adaptive behavior can be taught. Additionally, the army leadership has also directed that, at the very beginning of their command and staff college course, four days be devoted to teaching the concepts of adaptive campaigning. In short, Australian Army leadership has recognized the centrality of complexity in the operational environment and current limitations in dealing with it; and in response, they have enthusiastically endorsed adaptive campaigning and the training associated with it.⁸² A cooperative effort with the Australians to develop adaptive training methodologies would appear to hold great promise.

b. RAND Study of French, United Kingdom and Israeli Training

At the same time that we have been conducting this study, the RAND Corporation, also sponsored by the Deputy Under Secretary of Defense (Readiness), has been surveying current training practices in foreign militaries. Our discussions with personnel involved in that study revealed a number of relevant findings with regard to training adaptability.⁸³

⁷⁹ "Commander's Appreciation and Campaign Design," U.S. Army, TRADOC Pamphlet 525-5-500 version 1.0, 28 January 2008.

⁸⁰ "Adaptive Campaigning: The Land Force Response to Complex Warfighting," Future Land Warfare Branch, Australian Army Headquarters, Canberra, December 2007.

⁸¹ Meetings with Lieutenant Colonel P.J. B. Sowry at Carlisle May 5-6, 2008, followed up by e-mail and meeting with Anne-Marie Grisogono June 23, 2008.

⁸² Anne-Marie Grisogono, Research Leader, Complex Adaptive Systems for Defence, Australian Department of Defense, Conversations with IDA and OSD personnel, Washington, D.C., October 6, 2008.

⁸³ Meeting between IDA and RAND study teams, March 27, 2008.

While RAND personnel did not report finding any purpose-designed adaptability training in the foreign militaries they surveyed, they did describe finding training and institutional practices which affected the development of the capacity for adaptability. Some specific examples:

- In the case of France, RAND found more training, relative to U.S. practice, in basic and tactical skills prior to a first assignment. [This is consistent with the findings in our original study that adaptability is dependent on proficiency in basic professional skills—they are foundational.]
- French officers have the opportunity to develop inter-cultural relational skills in a program that requires them to study abroad for twelve weeks.
- The greatest contributor to adaptability in the French military appears to be experience. At any one time, 50,000 of 130,000 personnel are deployed. Deployments are relatively short (6 months) and to varied areas where the French have responsibilities. Small units conduct distributed operations, retaining autonomy and authority and relying on local sources for both supplies and information. They are required to assimilate the operational environment and adapt to it.
- RAND found that, as with the French, the British establish a foundation for adaptability through a thorough grounding in traditional missions and skills.
- Both the British and French have a longer path of career development than in the U.S. military, resulting in older more senior leaders serving as unit commanders. For example battalion level command is seen as a position for high level performance at the outset, not as a training ground for promising but less prepared and younger leaders.
- RAND identified one situation in which a failure to prepare for scenarios across the range of military operations (ROMO) resulted in an inability to adapt to the enemy's change in tactics. During the many years of peacekeeping, Israeli personnel became accustomed to dealing with day-to-day Palestinian problems in a particular way (In fact, SOD contributed to their success in this context.); but they were rewarded for doing well the same thing over and over. As a result, conventional force-on-force operations skills withered. Consequently, having forgotten how to conduct force-on-force operations, they performed poorly against Hezbollah in 2006.

RAND personnel considered that their survey of foreign militaries revealed a number of insights relative to adaptability training and development:

- The teaching of operational lessons learned results in ongoing adaptation.
- It is possible to devise a system that can adapt individual units to different operational environments

- Operational experience, when combined with unit cohesion, can alleviate the requirement for collective training to a significant degree.
- Leader education and training provides a high payoff in terms of unit capability in return for a relatively small investment.

We suggest the teaching of operational lessons and preparing units for specific operational environments are, perhaps, more about organizational adaptation than the development of adaptability within individuals and commander/leader teams, though such training provides a necessary foundation for adaptability. In the former case, units are learning how to deal with new, but known, situations; in the latter, individuals are prepared to respond effectively to unpredictable change in the future. Observations concerning the value of operational experience and unit cohesion are consistent with our model for adaptability that includes a component of intuition based on experience and a component of social skills that includes teamwork. However, recognizing the value of experience and unit cohesion does not obviate the potential value of additional training designed specifically to develop adaptability and adaptability-related skills. The observation concerning the high payoff for leader education and training should be of particular interest to the Services, all of whom are concerned about return on investment. Efforts to reduce time in the classroom may, in some cases, have real merit; but if those efforts fail to recognize the long term value and impact of quality education and training, they will, as the RAND study indicates, in the long run be counterproductive.

c. Other Possible Foreign Military Instantiations of Adaptability-like Training

Other research revealed instances where training in foreign militaries contributed to the development of adaptability skills. Two of particular interest are:

- The *Perisher* Course, which qualifies UK submariners for command, requires solid hands-on professional skills as well as the ability to perform under pressure and make decisions when tired.⁸⁴ This type of “crucible experience” training is key to developing intuition and the ability to trust one’s judgment in responding effectively to new situations. The course also develops team social skills as class members strive to insure everyone passes. This is the opposite of courses, or even career assignments, where individuals succeed by besting those with whom they are studying or working.
- Dr. Michael D. Matthews at West Point found attributes associated with adaptability being developed and tested in the training of Norwegian Naval

⁸⁴ http://www.navy.mil/navydata/cno/n87/usw/issue_18/perisher.htm.

Academy cadets during a 10-week sailing mission on a tall ship and during a physically and mentally challenging POW exercise.⁸⁵

H. CONCLUSION

Our survey is open ended. We continue to find new leads that appear promising, and when time permits we continue to follow up on those we can. However, though far from complete, the survey to date has brought us to the position where we feel reasonably comfortable in reaching some preliminary conclusions about what exists in the way of purpose-designed adaptability training (not much). Our vetting of results and discussion of our conclusions with experts in several related fields also have served to give us reasonable confidence about what a proof-of-concept experiment might look like as well as some possible venues.

Finally, the survey has allowed us to develop some preliminary conclusions about the form of implementing strategy and policy subsequent to a successful experiment. The following chapters cover these insights.

⁸⁵ Michael D. Matthews, *Non-Cognitive Predictors of Soldier Adaptability and Performance*, brief presented at Adaptability Symposium 2007, December 11-12, 2007.

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V. BEST OF BREED

A. THE SERVICES

1. Attempts at comprehensive adaptability training

Two Army courses stand out as “best of breed” regarding training that appears to encompass the key attributes which contribute to adaptable performance. The first is the Adaptive Thinking and Leadership (ATL) course developed for use by the John F. Kennedy Special Warfare Center and School (SWCS). The second is the Adaptive Leaders Methodology being applied in the Basic Officer Leadership Course II (BOLC II) at Fort Benning and Fort Sill. These are the only examples of Service training that encompass all the components of the IDA adaptability training model.

An overview of the original ATL course was provided by those responsible for its development and implementation:

The [original] course developed for officers attending SF [Special Forces] training is entitled the Officer Adaptive Thinking and Leadership (O-ATL). It is a 3½-day classroom-based course focused on the adaptability requirements of the SF officer. It is placed at the beginning of the third phase of training for the officers, and introduces them to various concepts related to adaptability, using a combination of training techniques. Brief lectures are used to introduce ideas to the students, examples and case studies show their relevance to the SF environment, and exercises increase student understanding of the topics and allow them the opportunity to practice performing adaptively in a controlled setting.

A classroom setting was chosen because the course was intended to provide the officers with the initial foundation for approaching adaptive performance in the higher-fidelity field training exercises in which they participate at later stages of training. Past research has shown that training is more effective if participants have a framework for understanding what they will encounter in training (e.g., Goldstein, 1993) and one of the goals of the O-ATL was to provide this framework. As such, the course was designed to set students up for success in

handling the adaptive performance requirements of their later SFQC [Special Forces Qualification Course] training as well as their SF jobs.⁸⁶

The training was designed to provide the students with an understanding of the meaning and necessity of adaptability and with strategies for handling adaptability situations once they have left the training environment. Course content focuses both on cognitive skills, including critical thinking and decision making, and on relational skills, including self-awareness, understanding others, negotiation strategies, and leading an adaptable team. Pilot classes were administered in March- April 2003 and January 2004. Positive reaction to the initial SF officer course led to funding for the development of three subsequent courses at SWCS and one at the Command and General Staff College (CGSC) through 2007. Additional course applications include:

- Special Forces Warrant Officer Basic Course
- Civil Affairs Qualification Course
- PSYOP Qualification Course⁸⁷
- Special Operations branch curriculum—ILE at Command and General Staff College⁸⁸

Though a comprehensive evaluation plan, with metrics, was originally developed for this training, the Army was satisfied that the course was achieving its intended purpose and chose not to fund the evaluation plan.

The Adaptive Leader Methodology (ALM) was developed by Major Don Vandergriff while he was an Army ROTC instructor at Georgetown University from 2000 to 2005. In August 2005, the methodology was introduced in a pilot modification of the BOLC II course for Second Lieutenants en route to their first assignments. Based on a successful pilot, it was fully implemented at Fort Benning and Fort Sill in 2006. Again, the course content focuses both on cognitive skills, including intuition, critical thinking and decision making, and on relational skills through practical experience in leadership positions.⁸⁹

⁸⁶ Army Research Institute for the Behavioral Sciences, “Developing Adaptive Proficiency in Special Forces Officers,” Research Report 1831, February 2005, p. 5.

⁸⁷ The civil affairs and PSYOP courses now also include an intense “crucible experience” field training exercise designed to further foster adaptability.

⁸⁸ “Adaptability: Research Concepts and Findings,” Dr. Stanley Halpin, Chief, Leader Development Research Unit, U.S. Army Research Institute, Brief to Adaptability Symposium 2007, December 11, 2007.

⁸⁹ This description of ALM is based on: BOLC Task Force, US Army Accessions Command and Army Capabilities Integration Center (forward), “Adaptive Leaders Methodology (Applied),” Brief presented by LTC Max Padilla (ret.) and MAJ Don Vandergriff (ret.), December 11, 2007. See also: Department

ALM focuses on scenario and situational based training, progressively adding complexity and ambiguity. ALM uses the experiential learning model to develop the Rapid Decision Making approach (Primed Recognition Model). The training revolves around the use of Scenarios that Enable Adaptability (SEA). Instructors intersperse historical case studies throughout the scenarios. Scenarios present dilemmas, require critical thinking and decision making under stress, and allow students to experience failure in a safe environment. The methodology lets the students experiment with leadership in a mission context and allows them to “get their hands dirty” in a variety of leadership positions and situations.

In the ALM process, learning comes through scenario training using tactical decision games and through free play exercises, rather than through presentations. Most tasks become learned through doing; and task learning is subordinate to leader development. Emphasis is on the student finding a solution that works, rather than being told the answer.

ALM highlights the importance of employing quality trainers, who have themselves been properly prepared to train the students. Delivering a SEA requires skill and energy on the part of the trainer. The methodology calls for the use of case studies, where there can be multiple solutions, logistical shortages, and branches and sequels to the original mission. The trainers have to be ready to adjust the scenario based on the dictates of the situation.

A number of training commands have shown an interest in using all or parts of ALM. However, since the training has not been applied in a universally consistent manner and there are no metrics associated with it, indications of its value are anecdotal. We find it encouraging that junior officers who have had the training and have subsequently deployed to Iraq and Afghanistan have credited the training with being their best preparation for their real world and very dangerous assignments, where being adaptable is essential to success.⁹⁰

of the Army, Commanding General, United States Army Accessions Command, Deputy Commanding General for Initial Military Training, Memorandum: Basic Officer Leader Course (BOLC) Policy and Guidance, Fort Monroe, VA, April 24, 2008.

⁹⁰ Donald E. Vandergriff, *Adaptive Leader Course (ALC) Teaching Old Dogs New Tricks: A Proposed Addendum to the Capstone Concept, White Paper*, Coordinating Draft, U. S. Army Capabilities Integration Center (Forward) May 10, 2006, Annex H (Testimonials from the Field).

2. Other Service Education/Training and Training Tools Focused on Aspects of the IDA Training Model

One course that teaches some, but not all, aspects of the IDA adaptability model is the “Think Like a Commander” module⁹¹ used as part of the Armor Captains Career Course at Fort Knox. Students are put through a series of vignettes and required to identify the critical information required to make decisions and take action. Students are subjected to repetitive task performance under varying conditions and at increased speed, and their thinking patterns and decision-making are compared to case-based expert models. Ingraining expert habits in this manner is akin to developing intuition, but in a manner that accelerates the process. The particularly attractive aspect of this course is that it has metrics, which are lacking in all other adaptability-related training venues. Significantly, “Recent evidence indicates that TLAC develops key battlefield thinking skills comparable to those exhibited by CPTs with OIF/OEF experience.”⁹²

One component of adaptability, critical thinking, has been a particular focus of education and training at several institutions. Most colleges and universities contend that developing the critical thinking ability of their students is their primary purpose. However, as pointed out by Derek Bok, former president at Harvard University, “...most professors have an imperfect understanding at best of the progress their students make in critical thinking and know little or nothing of the research on the subject.”⁹³ Taken in this light, the efforts of academic leaders and particular faculty members at the Naval Academy, the Industrial College of the Armed Forces, The Army War College and Command and Staff College, as well as the Marine Corps University, are particularly impressive. The challenge is a significant one. Thinking critically requires developing the habit of applying specific standards to one’s thinking. Internalizing the habit requires considerable practice and a continuing effort. Without a specific concept of what critical thinking entails and without a commitment on the part of both students and faculty to the standards of critical thinking in every venue, students will not develop this important component of adaptability. The deans and professors who are committed to making critical thinking a focus of education throughout their institutions deserve the

⁹¹ “Training Adaptive Thinking with Think Like a Commander,” Brief by Dr. James Lussier, Chief, Fort Bragg Scientific Coordination Office, U.S. Army Research Institute. CD: “Think Like A Commander: Captains in Command,” Research Product 2006-04, U.S. Army Research Institute for the Behavioral and Social Sciences Armored Forces Research Unit, Fort Knox, KY, July 2006.

⁹² “Adaptability: Research Concepts and Findings,” Dr. Stanley Halpin, Chief, Leader Development Research Unit, U.S. Army Research Institute, Brief to Adaptability Symposium 2007, December 11, 2007.

⁹³ Derek Bok, *Our Underachieving Colleges* (Princeton, NJ: Princeton University Press, 2006), p. 145.

wholehearted support of their school leadership, for the hard work required to maintain standards of critical thinking will be resisted by faculty content to focus on “what” they are teaching and by students content to learn the “right answer.”

In the development of relational skills, the Marine Corps University provides an excellent example of an effective means of teaching foreign cultures. Rather than assuming that it is possible to know with what cultures leaders will need to interact in the future and then teaching one or two cultures based on that assumption, the Command and Staff College teaches operational culture using a systematic approach that can be applied to any culture. Students learn to look at a culture in terms of five dimensions: environment, economy, social structure, political structure, and belief systems. They then apply this approach by examining two specific cultures: one in the Middle East and one in Sub-Saharan Africa.⁹⁴ Not only does this methodology prepare students to interact effectively in a foreign culture, but it enhances their critical thinking skills in the process.

We were introduced to several variations of 360 programs designed to increase self-awareness. Interestingly, some of the better recognized efforts were focused on senior leaders. While development of self-awareness, as with all aspects of adaptability, is important at every stage of a career, it is important to begin the development early in a career, in order to have a foundation on which to build. While there is a general recognition of the value of the 360, there has also been a reluctance to use it on a wide-scale basis, because of the expense involved in providing individualized feedback by competent counselors. The Center for Naval Leadership has recently undertaken to overcome that cost by instituting an automated 360, called SMARTS, that is capable of serving the dual purpose of cultivating individual self-awareness and, at the same time, providing data on an organizational basis to support interventions to improve operational readiness. The industrial College of the Armed Forces and the Army Command and staff College also expose their students to 360/self-awareness programs.

Among the programs we have observed or otherwise become acquainted with, the “best of breed” in terms of technology development with potential to support adaptability related training, is that of the Army’s Institute for Creative Technologies (ICT). It has contributed to existing Army and USMC training programs and offers significant promise for enhancing training in other venues. As an example, the Navy is currently working

⁹⁴ Marine Corps University, “Educating Adaptable Leaders for an Unpredictable Future,” Brief presented by LtCol Jay L. Hatton, Command and Staff College, and Dr. Wray R. Johnson, School of Advanced Warfighting, December 11, 2007.

with ICT to improve its Battle Stations 21 training platform.⁹⁵ ICT's Hollywood-style simulation techniques can effectively add realism to scenarios designed around the adaptability training model to make them realistic crucible experiences. ICT's focus on rapidly reconfigurable training scenarios is especially important in that one of the keys to effective adaptability training is the adaptation of the training events themselves. Adaptability training requires an environment in which scenarios are not predictable and responses cannot be scripted in advance by those being trained. The goal is to present the student, or target audience, with a series of complex problems, each in the context of a situation marked by change.

Finally, the USMC training in the Mohave Viper Exercise at 29 Palms and the Army Brigade Combat Team (BCT) pre-deployment training at the National Training Centers, using the lessons learned in OIF and OEF, has itself adapted significantly and is important in preparing units and leaders to adapt to the operational environment to which they are deploying. To the extent that this training takes those being trained beyond their past experience it serves to cause them to adapt to the current operating environment. However, this training falls into the category of applying lessons learned to ongoing training as described in the original IDA study.⁹⁶ While it is indeed excellent training in domain-specific skills essential to developing adaptability, it does not have the specific purpose of developing the metaskill of adaptability.. Without that purpose, it cannot serve the larger end of purposefully developing, in an integrated way, the components of adaptability that will facilitate effective performance in other unpredictable operational situations in the future.

B. BEST OF BREED BEYOND THE SERVICES

In addition to the Service related initiatives, three other efforts our research so far has discovered warrant mention on our “best of breed” short list. These are the Australian recognition of the need for adaptability, a former Israeli attempt to teach adaptability, and the Center for Creative Leadership (CCL) training closely aligned with the IDA adaptability components.

As outlined above, the Australian Army has embraced the need for adaptability and is designing its approach to land warfare around the notion of “Adaptive Campaigning.” This approach is based on the same conclusion reached in the original IDA study: in asymmetric war the problems faced by our militaries are fundamentally

⁹⁵ Rodney A. Chapman, Naval Service Training Command, Phone Conversation, June 10, 2008.

⁹⁶ Tillson, *Learning to Adapt*, p. 19.

different than those of conventional war. The problems present themselves as complex adaptive systems that must be dealt with in a fundamentally different way. Rather than train soldiers and leaders to recognize situational patterns and apply previously trained solutions, we must train them how to cope successfully with situations involving complex adaptive systems including adversaries. Training must therefore teach methods for coping with these unpredictable and unstable situations and replicate the range of potential complex adaptive systems anticipated without attempting to prescribe templated “approved solutions.” Although the Australians land forces have not yet determined how they will modify current training, they have conducted one experiment, are planning additional experiments in the near term, and already have made policy decisions to move the direction of purpose-designed adaptability training. Preliminary indications are the training will at a minimum include all elements of the IDA model.⁹⁷ We intend to continue to work cooperatively with our contacts there, since at least from a policy perspective they are ahead of the U.S.

Systemic Operational Design (SOD) is a thinking/planning and execution process for dealing with adversaries embedded in complex adaptive systems. It was used successfully in Israel where it was taught using methodologies that appear to resemble our vision of the crucible experience scenario-based performance training, including the elements of the IDA model. However SOD was somewhat controversial in Israel and it was discontinued several years ago.

More recently the US Army studied SOD and has adopted its essence, which is an exploratory, learning approach to dealing with complex adaptive systems or wicked problems. The somewhat simplified and streamlined U.S. Army version of SOD, Commander’s Appreciation and Campaign Design (CACD), is taught in part through scenario based training. Since cognitively it requires a combination of intuition and critical and creative thinking and as a commander/staff process requires effective interpersonal and relational skills, it could be an instantiation of one version of adaptability training when implemented at SAMS and the Army War College during the next few years.⁹⁸

The Center for Creative Leadership (CCL) has long conducted leadership training for senior executives including military flag rank officers. This training included aspects of both the cognitive and relational skills in the IDA training model and relied in part on

⁹⁷ See “*Adaptive Campaigning*” *op. cit.* paragraphs 19 and 20. The Australian conceptual approach outlined appears to be an application of abductive inference.

⁹⁸ CACD also appears to be based on abductive inference.

scenario case study methods. While the CCL training domain generally was business or government and not military, the Navigating Complex Challenges Course⁹⁹ and, more generally, CCL experience in training crisis leadership could provide a relevant foundation for training adaptability, provided the scenarios were carefully chosen from the ROMO in a JOE.

C. CONCLUSIONS

Our original study put forth the position that adaptability was the key metaskill needed for individuals, teams and organizations to cope with the range of challenges in the 21st Century. The study argued that solutions to many future military problems could not be prepackaged and trained according to the familiar task, condition, and standard methodology. Instead, a new approach to training designed to enhance adaptability performance was needed; and this approach was required for portions of training/education for individuals, teams and units at all levels. Our survey, especially the best of breed examples cited, indicates that there appears to be modest progress in this regard. However, this kind of training is still in its infancy and, despite the efforts to date, the original questions of whether it is doable and if so how to purpose-design adaptability training remain essentially open.

⁹⁹ <http://www.ccl.org/leadership/programs/NCCOverview.aspx>.

VI. PROOF-OF-CONCEPT ADAPTABILITY TRAINING EXPERIMENT

As discussed above, we have concluded that there is currently no purpose-designed and validated adaptability training. Many leaders have called for the development of adaptability, at all levels; and researchers have identified what they believe are the essential elements of adaptability training. What is currently lacking is evidence that adaptability, in the comprehensive sense depicted by the IDA model, can be trained. Therefore, in order to support the application of scarce resources to efforts intended to enhance adaptability, it would be of overarching value to design and conduct an experiment to test the hypothesis that adaptability can be trained in an intentional manner.

Succinctly stated, the goal of such an experiment would be to determine whether adaptability training can improve performance. In order to achieve that goal, and based on our research to date, we believe that the experiment should include specific elements.¹⁰⁰

The experiment should seek to improve performance on all of the four key components of the IDA model: intuition, critical and creative thinking, self-awareness, and social skills, including cross-cultural awareness, social awareness, and influence skills.¹⁰¹ We believe the cognitive portion of the experiment will be the most challenging. We anticipate that it is likely in some form to include a structured explanation of and approach to applying abductive inference when confronting complex scenario problems, using either intuition or creative thinking or both in combination.

¹⁰⁰ In writing this section, we are indebted to the ideas and recommendations provided by numerous researchers, including: Dr. Barbara Black, Dr. Stanley M. Halpin, and Dr. James W. Lussier of the U.S. Army Research Institute for the Behavioral and Social Sciences; Dr. Rose Mueller-Hanson and Dr. David Dorsey of the Personnel Decisions Research Institutes, Inc.; Dr. Elaine Raybourn of Sandia National Laboratories; Dr. Stephen J. Zaccaro of George Mason University; Dr. Jan Cannon-Bowers of the University of Central Florida; Dr. David Horth, Dr. Bob Rosenfeld, Dr. Gregory B. Laskow, Dr. Kerry Bunker, Dr. Mary Lynne Pulley and Dr. Talula Cartwright from the Center for Creative Leadership; Dr. J. D. Fletcher, Dr. John E. Morrison, and Dr. Frank L. Moses of the Institute for Defense Analyses; and Dr. Patricia Romano McGraw.

¹⁰¹ This is an assertion put forth as a result of our research to date including vetting with scores of experts none of whom disagreed and many of whom offered suggestions which we incorporated.

Because different jobs call for varying degrees of adaptability and varying emphasis on the components of adaptability, the experiment should be tailored to job-related adaptability requirement profiles of the trainees. Similarly, an effective experiment must recognize that the optimum time allocated to training each component or dimension of adaptability is a domain-specific variable dependent on organization, operational context, mission, and individual functional role.

Recent brain function research shows that effective learning is a function of emotional involvement in the learning process;¹⁰² therefore, the experiment must engage the participants fully. Additionally, adaptability training requires varying the training challenge or problem in ways that require those being trained to demonstrate the ability to adapt. Therefore, we concluded that the experiment should be based around multiple simulated “crucible experience”¹⁰³ scenarios requiring behavioral responses.¹⁰⁴ Because of the variety of situations in which the military is called to respond, the scenarios then should reflect that by encompassing a broad representation of the different kinds of challenges military personnel will face across the Range of Military Operations (ROMO)¹⁰⁵ in a joint operating environment (JOE).¹⁰⁶ There are practical limits to this dictum, but, nevertheless, future training should seek to significantly broaden its focus in this direction.

Initially, the experiment scenarios should be based on tactical (well-defined) problems, as opposed to strategic (relatively more ill-defined) problems. This is because from a practical standpoint tactical level problems appear easier to craft for an experiment.¹⁰⁷ The scenarios should provide experiential variety, and they should include both carefully crafted trigger events and feedback opportunities. To be truly

¹⁰² Greenspan and Shanker, *The First Idea*.

¹⁰³ A crucible experience is “...a defining moment that unleashes abilities, forces crucial choices, and sharpens focus. It teaches a person who he or she is.” Originally in Warren G. Bennis and Robert J. Thomas, *Geeks & Geezers: How Era, Values, and Defining Moments Shape Leaders*, Boston, MA: Harvard Business School Press, 2002, p.16. Quoted in both Leonard Wong, *Developing Adaptive Leaders: The Crucible Experience of Operation Iraqi Freedom*, Carlisle, PA: Strategic Studies Institute, U.S. Army War College, 2004, p. 2. and E.M. Raybourn, E. Deagle, K. Mendini, and J. Heneghan, *Adaptive Thinking and Leadership Simulation Game Training for Special Forces Officers*, Orlando, PA, Interservice/Industry Training, Simulation and Education Conference Proceedings (Paper No. 2370), 2005, p. 5.

¹⁰⁴ When vetted with experts cited in footnote 100, above, they agreed.

¹⁰⁵ Capstone Concept for Joint Operations (Version 2.0), Department of Defense, August 2005, p. 10.

¹⁰⁶ “Joint Operating Environment, Trends and Challenges for the Future Joint Force Through 2030,” United States Joint Forces Command, December 2007.

¹⁰⁷ Ill defined problems are more common at higher levels and are faced by more senior people. We argue adaptability training is just as important at this level, but it probably is not the place to start with an experiment.

crucible experiences, the scenarios should also require mental and physical toughness on the part of trainees, resilience often being a necessary precondition to adaptive performance.

Effective learning in a training environment requires skilled instruction. In order to evaluate the effectiveness of the training and assess the results of the experiment, it will be “...very important that instructors and facilitators [in the experiment] be trained to adequately observe and evaluate performance and deliver effective feed-back—especially with regard to adaptability-related skills.”¹⁰⁸

Of crucial importance to the conduct of a successful experiment will be the inclusion of metrics that are reliable (they measure something and can be reproduced), valid (they measure the right things), and precise (discriminate between people with different scores). In the few cases which we are aware of where there have been efforts to train adaptability in the past, there have been no metrics to validate the training.

The model for assessing training effectiveness developed by Donald L. Kirkpatrick in the 1950’s provides a useful guide for developing metrics.¹⁰⁹ His model addresses four levels of assessment:

- Level 1—Reaction: How well did the [participants] like the program?
- Level 2—Learning: What principles, facts, and techniques were learned? What attitudes were changed?
- Level 3—Behavior: What changes in job behavior resulted from the program?
- Level 4—Results: What were the tangible results of the program in terms of reduced cost, improved quality, improved quantity, etc.? [Did training benefit the organization—improve performance and productivity of the organization?]¹¹⁰

Though it would clearly add to the time required to complete an evaluation of the training, it would be particularly desirable for metrics to go beyond level two in any assessment. In the very constrained training environment that exists, any new

¹⁰⁸ Army Research Institute for the Behavioral and Social Sciences, “Training Adaptable Leaders: Lessons from Research and Practice,” Research Report 1844, October 2005, pp. 12-14.

¹⁰⁹ D. L. Kirkpatrick, “Evaluation,” in R. L. Craig (Ed.), *Training and Development Handbook* (Third Edition), New York, NY: McGraw-Hill, 1987, pp. 301-319.

¹¹⁰ Ibid., p. 302.

commitment of resources to training will need to be justified on the basis of improved operational performance, both by the individual and the organization.

Assuming the experiment does demonstrate that adaptability can be trained, metrics will be important in publicizing the results, particularly to those who may be skeptical. Metrics also will be of value in supporting any future policy aimed at promoting purpose-designed adaptability training.

There is no question that the development of adaptability metrics will require considerable work, particularly metrics for the integrated capacity for adaptability itself. It has been suggested that one approach might be to measure the four components of the IDA model to establish a baseline, measuring resilience as a covariant.¹¹¹ It has also been pointed out that proving that enhanced performance in only one component of the IDA model contributes to the meta-skill of adaptability will be difficult.¹¹² Ideally, a number of experiments could be run in which a baseline could be established for both a control group and a group undergoing adaptability training. Both groups could be put through training either in a component area of the IDA model or in the crucible scenarios, and then pre- and post-training measurements would be compared for the two groups.

The above might be supplemented by more elaborate approaches to measuring the effectiveness of adaptability training. This might include monitoring of trainees using electroencephalogram (EEG) technology to gain neurofeedback during scenario performance.

In order to have the most value for future training, in addition to testing the hypothesis that adaptability can be trained; the experiment should seek to determine general adaptability learning principles. Adaptability learning, whether viewed from an individual or institutional perspective, is, by its very nature, an iterative process. Every adaptability training exercise in the experiment should be a learning experience for both those being trained and those conducting the training, and the lessons learned and principles derived from each experience should be captured for application in future training.

Finally, a viable experiment should be both scalable and affordable. While the goal of the experiment is to demonstrate that adaptability training can improve

¹¹¹ Dr. Stephen J. Zaccaro, Meeting at IDA, February 7, 2008.

¹¹² Patricia Romano McGraw, review of *Developing an Adaptability Training Strategy and Policy for the DoD* (draft), IDA Paper P-4358, Institute for Defense Analyses, August 15, 2008, p. 4.

performance, that goal must be seen in the context of a desire to develop the capacity for adaptability in personnel throughout DoD. Therefore, an experiment that is both effective and useful will be one that employs training techniques that can be extended to a broader audience and one that utilizes a methodology that will be seen as cost effective in terms of both time and money.

To have value in enhancing existing training and to be accepted by the Services as a sound basis for modifying existing training policies, an experiment must have all of these essential elements. Despite the acknowledged requirement for adaptable leaders and soldiers, as well as teams and units, there are many who feel that today's training already provides the foundation for sufficient adaptability. There is also widespread agreement that the military is fully employed and that there is little room for either additional operational deployments or additional training. Therefore, a successful experiment will be one that demonstrates that, without significantly increasing the time devoted to it, current training can be modified to improve the development of adaptability while maintaining all its existing goodness, thereby improving overall operational performance in a much wider range of operational contexts.

A. INITIAL IDEAS

We considered a number of possibilities that might be appropriate venues for an experiment. Our premise has been that most future adaptability training should not be unique stand-alone events, but, rather, should be incorporated into existing training scenarios. The goal is for those being trained to become more adaptable than they otherwise would be in employing the basic tactics, techniques, and procedures that constitute the core competencies of each of the Services. Based on our study, we have identified several training venues where an adaptability training experiment appears to be feasible.

For the purposes of individual training, the best example, to date, of a purpose-designed adaptability training course is the Army's Special Warfare Center and School's Adaptive Thinking and Leadership (ATL) program—originally designed for Special Forces(SF) and adapted for Civil Affairs (CA) and Psychological Operations (PSYOP) Training. The module has undergone modifications since its inception and lacks metrics, but it provides a firm basis for a formal experiment that would meet the rigorous requirements of social scientists. Essentially, what would be required would be to verify that the existing training addresses all aspects of the IDA model and then to apply metrics to the training. In fact, metrics were previously developed for the module, but not

employed. If this course of action were chosen, an analysis of each entire course also could be conducted to identify other aspects of the courses that contribute to developing adaptability.

Whether or not SWCS is selected to be the venue for an experiment, it does offer an opportunity to refine metrics previously developed or to develop new metrics. One suggestion offered is that metrics could be developed which use a situational judgment test (SJT) approach.¹¹³ If the chosen metrics were successful in providing an overall assessment of the growth of adaptability across the entirety of the Civil Affairs and PSYOP courses, this would constitute a proof-of-concept that adaptability metrics can be developed.

An alternative venue for individual training would be BOLC II training at Fort Benning, which uses the Adaptive Leader Methodology (ALM). This training for new officers could be assessed for conformity to the IDA model and modified as necessary to include all aspects of the model. Experience gained from relooking the ATL training could be incorporated in the process. Again, development of suitable metrics would be required; and the inclusion of a control group would further assist in determining whether the training resulted in more adaptive performance. This venue would also provide training to GPF personnel who, unlike the Special Forces personnel, have not been selected based on a perceived aptitude for adaptability.

A similar approach could be taken with the TLaC component of the Captains Career Course or the CLE portion of the Calvary Commanders course at Fort Knox if that course comes to fruition. This would require the addition of training focused on relational skills. It would also require the development of more comprehensive metrics beyond those currently employed in the TLaC course. Use of a control group and appropriate metrics could demonstrate whether the training enhanced adaptability performance.

If one desired to conduct the experiment using more senior leaders, a module could be added at the National Defense University (NDU) to the curriculum at the National War College or Industrial College of the Armed Forces, or even in the CAPSTONE course for newly selected flag and general officers. NDU has assets and programs in place that would facilitate such an experiment—self-awareness through the Executive Assessment and Development program, a course in critical and creative

¹¹³ Dr. James W. Lussier, Chief, Ft Bragg Scientific Coordination Office, U.S. Army Research Institute, e-mail, January 8, 2008.

thinking, a diverse student body, and a war-gaming center. However, since there has been no previous attempt to provide purpose-designed adaptability training at NDU, conducting the experiment there would require a major design effort and adjustment of an already tight curriculum. Additionally, we have considered an initial experience best suited to a tactical problem, and NDU focuses on the operational and strategic levels of war. We believe that, ultimately, adaptability training should be integral to the NDU experience, but that may not be the best place to conduct an experiment, if one is to accomplish that goal at an early date.

A second venue for senior leaders might be through a commercial company with experience in providing leadership and management training and education to business executives. Such an organization might be capable of designing an adaptability training course tailored for military leaders. This would have the advantage of drawing upon the considerable experience of professionals in the field. It would also have the advantage of calling into play the business practices of companies accustomed to developing a product rapidly in order to compete, thereby increasing the likelihood that an experiment would be fielded at an early date. Conducting an experiment in this manner would require detailed management and oversight in order to insure that the experiment developed included the essential elements listed above, including metrics.

We have also considered possibilities for experiments that would train adaptability for commander/leader teams (CLT) or units. We are not aware of any existing purpose-designed adaptability training for such groups. However, the Services do conduct training based on lessons learned in the current operational environment, which has the ancillary effect of developing component skills associated with adaptability. Thus, one approach to an experiment would be to introduce an adaptability training module for the CLT of one of a designated pair of Army maneuver battalions undergoing home station training prior to pre-deployment training at the National Training Center or, for the Marines, at 29 Palms. Paired battalions would then be confronted with identical or similar dilemmas requiring CLT adaptability skills. With appropriate adaptability metrics, the performance of the units that received adaptability training could be compared to that of the sister battalions that did not receive the adaptability module. Conceivably, the performance could be tracked in the CENTCOM AOR as well. This methodology could be applied to a series of battalion CLTs over a period of a year or even longer. The same methodology could also be applied to companies in sister battalions. We are intrigued by this option but recognize the significantly greater resource commitment it would require.

Another possible venue for CLT adaptability training would be the combat teams aboard the Navy's Aegis ships. The Navy spent nearly a decade following the shootdown of an Iranian airbus by the cruiser Vincennes studying ways to improve tactical decision making under stress. The products of that study, tailored to the IDA model by inclusion of such tools as the SMART 360 program developed under the sponsorship of the Center for Naval Leadership, could form the basis for an adaptability training experiment. With appropriate metrics, the adaptability of ship teams receiving adaptability training could be compared to that of ship teams that did not receive the training, during any of the pre-deployment training exercises regularly conducted.

Finally with regard to unit training, obvious groups that would benefit from adaptability training are those comprised of men and women being sent to Afghanistan and Iraq as part of the provisional reconstruction teams (PRTs) or Military Transition Teams (MiTTs). The former are currently being trained at Fort Bragg and the latter at Fort Riley. Training for both is in the process of being consolidated at Fort Polk. It is conceivable that an experiment could be devised which would take advantage of the relocation—using trainees at the present locations as control groups and providing adaptability training to the initial personnel assigned to train at Fort Polk. Providing cadre training for the instructors at Fort Polk would be an essential part of such an experimental process. This option has the advantage of training a group of GPF personnel being formed into teams that are bound for assignments where adaptability skills are at a premium. The disadvantage is that unlike most of the earlier options mentioned there is no foundation around which to build the training. The entire package would require creation from whole cloth.

B. AN APPROACH TO AN EXPERIMENT

While we have established a need for adaptability training, interest in learning how best to do it, the IDA model as a framework around which to design training, a few best of breed examples, and possible options for an experiment, the real challenge is to actually design and conduct a proof of concept experiment. This will require the participation of the best minds in all related fields of research and training. Additionally it will be important to involve all the Services in its design and execution from the beginning, as they are more likely to see value in the results of the experiment if they have been included. Therefore, we envision that initially there will be a two step process. The first step will require the organization selected to conduct the experiment to design and outline a plan for a comprehensive experiment that includes the elements described

above. The second step will be a formal vetting of that plan with behavioral scientists and training experts, including representatives of each of the Services.

The organization conducting the experiment will have a number of possible options in deciding on an approach to the training and a venue for it, some of which have been discussed above. It could decide to build on the “best of breed” initiatives we have identified. This would include the ATL course for Special Forces at Fort Bragg, the ALM utilized in BOLC II training at Fort Benning, or the Think Like a Commander course at Fort Knox. Another possibility at Fort Knox is the Cavalry Leaders Course, which purportedly may soon be using the CLE training tool and scenarios developed by Lockheed Martin.¹¹⁴ Planners could also choose not to use existing training programs, but ask a commercial company with a history of training leadership to design an entirely new adaptability training course, possibly for senior officers.

In addition to building an experiment around existing individual training it might be possible to design an experiment for a more laboratory-like environment. This could draw on aspects of existing training but would not be conducted in conjunction with ongoing training. Such a DARPA-like experiment might draw individuals from several Services and give them experimental adaptability training, perhaps several different versions to different groups with control groups in each case. This option would avoid the potential disruptions grafting an experiment onto existing training would entail. It might also offer greater flexibility and offer longer duration in a purely experimental mode. However it would have the disadvantages of not being seen as “real training” and it might have greater difficulty gaining manpower support and resourcing. It would also be difficult to devise metrics beyond Kirkpatrick’s level two for such an ad hoc group.

If those conducting the planning for an experiment choose or are encouraged to focus on a commander/leader team (CLT) or a unit, they would want to consider the size of the training audience as a factor in managing the experiment and controlling costs. Any of the groups discussed would be a possibility: the sister battalions or sister companies during pre-deployment training, combat information center (CIC) teams aboard Navy ships, or PRTs and MTTs. In the current operating environment, perhaps these latter groups have the greatest immediate need; so that an experiment that included them might produce the greatest return on investment. As Secretary Gates recently told cadets at West Point, “...the most important assignment in your military career may not necessarily be commanding U.S. soldiers, but advising or mentoring the troops of other

¹¹⁴ Confirmed by Rick Lozicki [rick.lozicki@lmco.com], LM Project Manager, July 1, 2008.

nations as they battle forces of terror and instability within their own borders.”¹¹⁵ This could put PRT & MiTT at the top of the priority list for resourcing an experiment. All of these options are discussed in more detail below.

Whatever the details of the experiment or the venue for the experiment, it will be important that it have been designed and agreed to by recognized training experts from all the Services and that it can be accomplished within the context of specific constraints—money, time to complete the experiment, and impact on trainers and the training audience. Our research has determined that there are professionals available, with experience in adaptability training, who could produce an outline plan for an experiment meeting the requirements of the current task. Similarly, we believe that recognized experts from academia, research organizations, and the training world would welcome the opportunity to critique such a plan and contribute to its refinement.

Finally, in order to insure the credibility of the experiment, it will be important that the results be certified independently. As Colonel H. R. McMaster recently observed with regard to relating military theory and practice: “the stark contrast between actual experience and the results of test and experiments argues for a critical examination of joint and defense experimentation.”¹¹⁶ A critical examination might be achieved by having the metrics for the experiment developed by a group separate from that planning the experiment or by having a separate group oversee the actual conduct of the experiment.

C. BUILDING A COMPREHENSIVE PLAN: GAINING CONSENSUS ON THE WAY AHEAD

The importance of the planning for an experiment is, perhaps, obvious. Equally important is recognizing the challenges involved in planning a meaningful experiment. ARI, which has more experience than any other group in the military with regard to efforts to develop adaptability training, has highlighted several concerns which should be of particular interest to planners. We think these concerns, discussed below, are valid. At the same time, we think it important that a fixation on the concerns not inhibit moving forward with an experiment. As the leader of ARI’s Training and Leader Development Division has stated, “...leader adaptability is key to success in the COE.”¹¹⁷

¹¹⁵ Robert M. Gates, speech delivered at the U.S. Military Academy, April 21, 2008.

¹¹⁶ H.R. McMaster, “Learning from Contemporary Conflicts to Prepare for Future War.” *Orbis*, Fall 2008, p. 581.

¹¹⁷ Barbara A. Black, e-mail to Waldo Freeman, March 4, 2008.

ARI's concerns, expressed recently in conjunction with our study, can be summarized as follows:

- Theories explaining why some leaders are more adaptable than others vary, and, therefore, approaches to training adaptability also vary.
- Adaptability is difficult to achieve and difficult to assess
- Adaptability depends on type of organization, operational context, mission, individual functional role, individual character and personality. Therefore, "A full 'validation' study should take all these factors into account, looking at the behavior of a range of individuals in a variety of positions and contexts."¹¹⁸
- An experiment that looks at only one approach to training adaptability or one aspect of adaptability will not produce results that can be meaningfully measured or used as a basis for establishing training policy.
- An experiment would be inadequate if it considered only the institutional environment and not the current operational environment.
- To date, "What the services have not been able to develop and execute on their own due time and resource constraints is a comprehensive, integrated, multi-dimensional longitudinal leader adaptability evaluation."¹¹⁹

We consider all of these concerns valid, and we recognize that it is likely because of the complexities that ARI highlights that neither the military nor any other organization has been able to muster the resources in terms of money, time, talent, and institutional support necessary to plan and carry out the type of experiment that would show whether or not adaptability training can be effective.

Taking into account these concerns and as alluded to above, we recommend that, as a critical early step, the organization developing the experiment convene an advisory workshop composed of behavioral and social scientists with experience in adaptability-related training and education. All services should be represented, but the workshop should not be overly large. The workshop should be tasked to conduct a critical review of the outline plan for an experiment developed by the organization conducting the experiment. That plan should include the essential elements of an adaptability training experiment discussed in an earlier section and take into account the concerns expressed by ARI. Particular attention should be paid to metrics that will provide a meaningful evaluation of the training, including the possibility of metrics that measure performance

¹¹⁸ Ibid.

¹¹⁹ Ibid.

well beyond the timeframe of the actual training—metrics that go beyond Kirkpatrick's level 2. The organization conducting the experiment should identify the best venue for the experiment, and the workshop should identify the interest and potential contribution of each Service and attempt to gain consensus on a plan for moving forward. The workshop should be chaired by an individual committed to maintaining the focus of the group and to achieving the specific goals of the workshop. It may be useful to have discussions facilitated by professionals in the scientific community who have experience in developing adaptability-related training programs. Experimentation is always an iterative effort. The goal of this experiment is not some form of perfection but scientifically significant results that can contribute to improving existing training programs, provide the basis for future experimentation, and inform the formation of training policy relevant to the current operating environment.

D. OPTIONS FOR AN EXPERIMENT

We offer here more details of possible approaches to adaptability training for the venues mentioned above we consider most feasible. We do not include the ATL course at SWCS, per se, because the goal is to show that adaptability training can improve the adaptability performance of the broader range of personnel in the general purpose forces. Though an experiment may demonstrate that adaptability training improves the performance of Special Forces personnel, that experiment would not be as persuasive as one involving general purpose forces; the reason is that the selection process for Special Forces involves identifying personnel who already have exhibited a tendency for adaptability. We also do not include pairs of maneuver battalions, Aegis combat teams, or War College or CAPSTONE curricula mentioned above, under the assumption that their resource demands probably would be too great for the pilot experiment. The five remaining options for experiments with GPF mentioned above could include the following components and phases:

Build on “Best of Breed”: Focus on BOLC II

- Phase 1: Assess adaptability training at SWCS, including (if possible) metrics, for guidelines. Determine which aspects of the SWCS adaptability training can be generalized to GPF tactical training. Simultaneously at the Infantry School develop job-related adaptability requirement profiles for junior infantry leaders (platoon leaders & platoon sergeants)
- Phase 2: Assess the Infantry School BOLC II POI to determine how much of it already incorporates aspects of the training the IDA study indicates are important to enhancing adaptability. Based on these results and incorporating

the phase 1 results, design a training module with suitable proof-of-concept metrics that would be the basis for an experiment.

- Phase 3: Conduct the proof-of-concept experiment by inserting the experimental module into the Infantry School BOLC II POI, before, during or after BOLC II. Determine general adaptability learning principles that can inform future GPF training.

Build on “Best of Breed”: Focus on TLaC and/ or the CLE courses

- Phase 1: Assess adaptability training at SWCS, including (if possible) metrics, for guidelines. Determine which aspects of the SWCS adaptability training can be generalized to GPF tactical training. Simultaneously at the Armor School develop job-related adaptability requirement profiles for Armor and Cavalry Captains.
- Phase 2: Assess the Armor School Captains’ Career Course (CCC) or Cavalry Commanders POI to determine how much of either, including use of TLaC and CLE, already incorporate aspects of the training the IDA study indicates are important to enhancing adaptability. Based on these results and including the phase 1 results, design a training module, including broadening TLaC and/or CLE vignette libraries as required, with suitable proof-of-concept metrics that would be the basis for an experiment.
- Phase 3: Conduct the proof-of-concept experiment by inserting the experimental module into the CCC or Cavalry Commanders POI. Determine general adaptability learning principles that can inform future GPF training.

Build on “Best of Breed”: Conduct DARPA-like experiment in a Laboratory Setting

- Phase 1: Assess adaptability training at SWCS, including (if possible) metrics, for guidelines. Determine which aspects of the SWCS adaptability training can be generalized to GPF tactical training. Assess the Infantry School BOLC II POI and Armor School CCC and Cavalry Commander POI modeling and simulation (M&S) tools for best practices. Simultaneously develop military job-related adaptability requirement profiles for the expected training audience.
- Phase 2: Based on the phase 1 results, design a training module incorporating appropriate M&S tools, the four key elements of the IDA model, and varied “crucible experience” scenarios intended to enhance the capacity of the training audience to bring about effective responses to altered situations appropriate to their job-related adaptability profiles. Additionally, insure suitable proof-of-concept metrics that would be considered acceptable by an independent expert review panel.

- Phase 3: Conduct the proof-of-concept experiment and report results including identification of general adaptability learning principles that can inform future GPF training.

Commercial Option: Ask the Center for Creative Leadership or other similar Senior Executive Training Organization to Design an Adaptability Training Course for Senior Officers

The Center for Creative Leadership (CCL) has a long and successful record of designing effective training for senior executives. The Military has used some of these courses for many years. The courses already include many aspects of the IDA model, including CCL’s version of the “crucible experience.” CCL would need to develop scenarios that are “domain specific”—integral to the range of military operations (ROMO), as well as suitable metrics. A drawback to this approach is that senior officer training focuses on the strategic and operational level of war, and we have recommended that scenarios in the initial experiment be based on tactical (well-defined) problems. However, using this approach for a second experiment would answer ARI’s concern that “A full ‘validation’ study should... [look] at the behavior of a range of individuals in a variety of positions and contexts.”¹²⁰

Build to Greatest Need: Focus on SSTRO (PRT & MiTT)

- Phase 1: Assess adaptability training at SWCS, including completing metrics for Civil Affairs adaptability training, for guidelines. Determine which aspects of the SWCS adaptability training can be generalized to GPF tactical training. Assess the BOLC II POI for aspects of the training that enhance adaptability. Simultaneously develop job-related adaptability requirement profiles for PRT and MiTT.
- Phase 2: Assess the existing training for PRT and MiTT to determine how much of it already incorporates aspects of the training the IDA study indicates are important to enhancing adaptability. Based on these results and incorporating the phase 1 results, design revisions to existing PRT & MiTT individual and unit POI (supported by appropriate M&S technologies) with suitable proof-of-concept metrics that will be the basis for an experiment.
- Phase 3: Conduct the proof-of-concept experiment by conducting PRT and MiTT training with the needed experimental elements incorporated into the POI. Ensure detailed evaluation and measurement of the experiment to determine whether adaptability has been enhanced and to what degree. Determine general adaptability learning principles that can inform future GPF training.

¹²⁰ Ibid.

E. CONCLUSION

Testing the hypothesis that adaptability can be trained in an intentional manner is the linchpin to moving forward with developing an adaptability training strategy and, from that, specific policy initiatives. The forgoing indicates that developing such an experiment appears feasible, though not without challenges. However, given the importance of developing more adaptable forces, we believe enough is known now to design a proof-of-concept experiment and test the hypothesis. The effort should begin at the earliest opportunity.¹²¹

We are optimistic that an experiment will demonstrate that training adaptability has the potential to be a feasible and worthwhile endeavor. At the same time, we do not suggest that one experiment will be conclusive in every regard or that a single training program or type of exercise is the answer to making people more adaptable. We would expect that the most effective adaptability training would come only as the result of a systematic program of development, experimentation, data collection, feedback, and repetition. Also, as we have discussed elsewhere, we do not suggest that there can be anything resembling an adaptability inoculation. To reiterate what we have said elsewhere, adaptability training to be effective must be part of a larger program that includes adaptability-related education, personnel assignment policies that include development of adaptability as a specific goal, and promotion policies that reward adaptability.

¹²¹ A strawman statement of work for an organization tasked to conduct an experiment is at Appendix G.

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VII. PRELIMINARY TRAINING POLICY INSIGHTS

Though an experiment proving that adaptability can be effectively trained has yet to be conducted and we have not yet developed an adaptability training strategy framework, our research to date provides a basis for reaching preliminary conclusions about likely future training policy recommendations that will contribute to developing adaptability within the DoD commensurate with the requirements of the current and projected operating environment. Implementing the recommendations will not be easy and will not be accomplished in a short timeframe, but failure to acknowledge the need to move forward with this aspect of training will simply delay the actions necessary to prepare the military for the challenges they face today and for the range of operations they can expect to face in the future.

First and foremost, adaptability training will be most effective and most beneficial when it is incorporated into a comprehensive effort, throughout DoD, to enhance adaptability. Developing adaptability in individuals, commander/leader teams, and units requires a culture of adaptability, including an environment of adaptability learning. A culture of adaptability promotes adaptability and its component skills through not only training, but through education, assignment policies, promotion practices, and its system of rewards and punishment.

In this regard, it is noteworthy that the recently published Army Strategy clearly reflects a recognition of the importance of adaptability and the need to develop adaptability in a comprehensive and purposeful manner.

Army training and leader development programs must prepare units and leaders to conduct Full Spectrum Operations across the five operational themes of Peacetime Military Engagement, Limited Intervention Operations (LIO), Peace Operations, Irregular Warfare and Major Combat Operations...Soldiers, leaders and units must be trained and developed to become broad and agile enough to quickly adapt their core skills as needed to function anywhere along the spectrum of conflict...The Army must also produce a steady flow of adaptive, competent, and broadly skilled leaders who can lead the execution of full spectrum operations, adapting their core skills for directed missions across Operational Themes...Adaptation must occur through training in units, the Generating Force,

professional education, operational assignments and experiences, and self-development.¹²²

It is significant that this strategy not only recognizes the importance of developing adaptability, but the fact that such development occurs not only through training, but through operational experience, institutional learning, and self-development as well.

Initiation of purpose-designed adaptability training will require a comprehensive assessment of current training, identifying those places in which training already likely enhances adaptability, but in an unsystematic way. The assessment will then need to be followed by a systematic augmentation of the training with methodologies designed to train all aspects of the IDA adaptability model. The goal would be to enhance existing training where appropriate to foster adaptability without increasing total training time. This assessment could start now.

Since military adaptability training requires exposure to the Range of Military Operations (ROMO) in the Joint Operating Environment (JOE), it follows that training for most types of organizations, at all levels, should include the periodic variation of training scenarios necessary to achieve this exposure. DoD Directive 3000.05¹²³ provides an excellent impetus to the diversification of training scenarios by raising stability operations to a priority equal with combat operations. A key characteristic of stability operations is unpredictability and the need for participants to be adaptable. Among other requirements of the directive are those that direct:

- The Under Secretary of Defense for Personnel and Readiness to develop a joint and combined stability operation training policy,
- The Chairman of the Joint Chiefs of Staff to provide annual training guidance that addresses stability operations capabilities and to develop curricula at joint military education and individual training venues for the conduct and support of stability operations,
- The Combatant Commanders to incorporate stability operations into military training and exercises
- The Commander of U.S. Joint Forces Command (USJFCOM) to establish, design, and conduct experiments to identify innovative ideas for stability operations, to support Combatant Commander stability operations training, and ensure forces assigned to UFJFCOM are trained for stability operations, and

¹²² U.S. Army, "The Army Strategy," August 22, 2008, pp. 23-25.

¹²³ DoD Directive 3000.05, Military Support for Stability, Security, Transition, and Reconstruction (SSSTR) Operations, November 28, 2005.

- The Secretaries of the Military Departments and the Commander, U.S. Special Operations Command to ensure curricula in individual and unit training programs and service schools prepare personnel for stability operations.

These requirements also highlight the need to coordinate education and training programs so they are consistent and mutually reinforcing with respect to enhancing adaptability. Additionally, this effort to prepare for stability operations should be duplicated in efforts to prepare for the other kinds of scenarios envisioned in the ROMO. The new Army Strategy indicates this is exactly the direction in which the Army is moving: “The Army will shift training to Major Combat Operations, Irregular Warfare, and Limited Intervention Operations...”¹²⁴ Monitoring of Service implementation of DoD Directive 3000.05 also could begin now and could be broadened to include other ROMO scenarios.

Purpose-designed adaptability training requires an effort to develop all four components of the IDA model: intuition, critical and creative thinking, self-awareness and self-regulation, and social skills. We anticipate that the emphasis for each of the components will vary depending on many factors, including level, type organization, operational context, mission, and individual functional role.

Adaptability requires extensive domain-specific knowledge, so adaptability training must be aligned with the existing training, education and experience necessary to develop a high level of professional skills and knowledge. This has significant implications for the amount, quality, and depth of both kinds of training and argues for integrating them when possible. And it also increases the demand for selectivity and proper preparation of instructors and others essential to the training process.

Since adaptability requires a high degree of domain specific knowledge, basic training in tactics, techniques, and procedures must be sound. Training in certain communities is widely recognized as being effective in this regard. Pilot training in all the Services, nuclear power training, and Special Forces training are examples of this. Training policy should require periodic reviews to insure that the standards for training across all communities require the development of a high level of expertise that will provide the foundation for training adaptability.

Effective adaptability training requires teachers, instructors, and mentors who are themselves adaptive and who are capable of varying scenarios, responding to student or

¹²⁴ U.S. Army, “The Army Strategy,” August 22, 2008, p. 24.

trainee actions as a scenario develops, and providing feedback in a manner that encourages the development of adaptability. The assignment of quality personnel with the appropriate experience to training and education assignments must be viewed as a priority, and good performance in those assignments must be appropriately rewarded.

Adaptability training is best delivered through methods which employ experiential learning. An Army research report describes the process in this way:

...an iterative process of practice, feedback, and practice is a necessary part of development. Individuals should have the opportunity to practice new skills, obtain feedback on their results, and apply what they learned from this feedback in subsequent practice sessions. In an adaptability context, individuals should have ample opportunities to practice their adaptability related skills in a variety of settings and obtain feedback from a variety of sources.¹²⁵

Particularly effective are active engagement through participation in case studies and scenario events, both with frequent feedback mechanisms and competent mentors. This does not preclude the use of increasingly popular distance learning, but it makes use of distance learning for adaptability training more challenging.

Adaptability learning requires perpetual reinforcement. Therefore, individuals must have regular exposure to adaptability learning situations throughout their careers, in both training and education environments; and unit deployment cycles and staff training schedules must factor in purpose-designed adaptability training for units and commander/leader teams on a regular basis. In particular, it must be recognized that training is required for senior personnel, as well as junior personnel. To emphasize this point and maintain perspective, the more senior a staff is, the more complex the problems it faces and the greater the need and the challenge to provide it training that requires adaptive responses. Interestingly, the adaptability-related training initiatives presented by the Services (with the exception of critical thinking at the Army War College, critical thinking and cultural understanding at the Marine Corps University and the Navy's SMARTS program to enhance self-awareness) are all focused on junior personnel. The process of continual learning is fundamental and should be accomplished by inserting adaptability learning initiatives into existing programs at every level, as illustrated in Figure 5.

¹²⁵ Army Research Institute for the Behavioral and Social Sciences, "Training Adaptable Leaders: Lessons from Research and Practice," Research Report 1844, October 2005, p. vi.

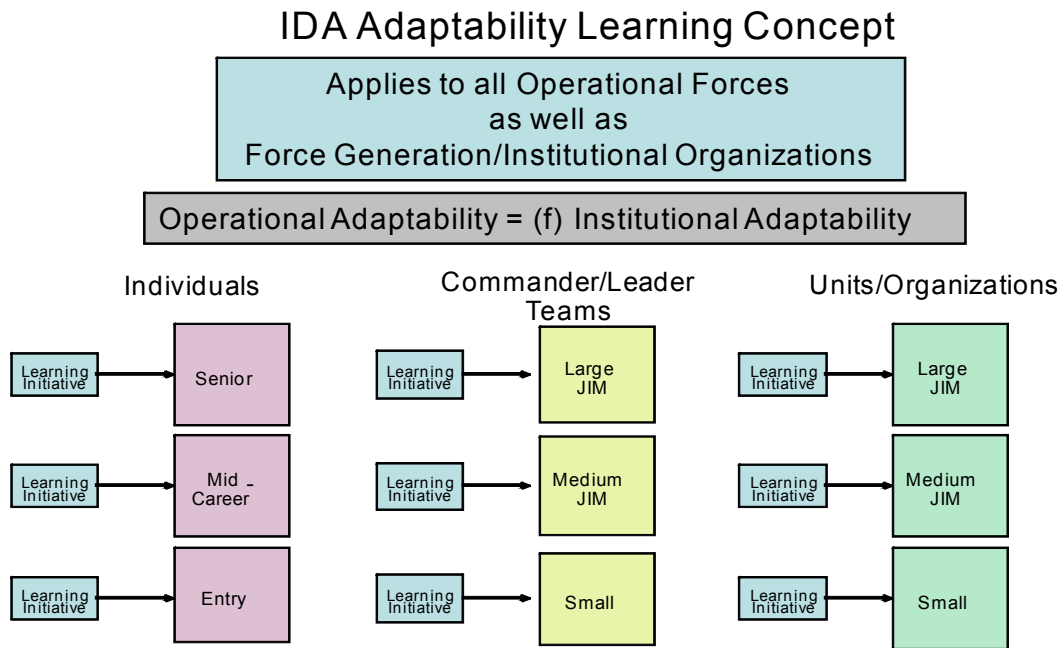


Figure 5. IDA Adaptability Learning Concept

Of particular importance, adaptability training must be tailored to specific audience requirements. Adaptability training must be related to a specific job or task or mission and to the relevant operating environment. It must take into account the wide variations of roles and missions among and within the Services. This means that adaptability learning for the military must focus on the range of military operations (ROMO) and on the land, air, or sea environment, depending on the branch and Service of the personnel being trained. The training must also be tailored to the level of responsibility of the training audience—tactical, operational, or strategic. Training for an Army platoon leader will be far different than that for a combatant commander's staff. Similarly, adaptability training must take into account the job profiles of the training audience, including in that profile the need for adaptability. Training for Special Forces personnel will be much different than that provided aircraft mechanics or nuclear reactor operators. Because of the differences in job profiles, there will be a higher payoff in the adaptability training provided one group, as opposed to that provide to another group. Despite these differences, there are also commonalities which will allow some aspects of adaptability training to be provided in a more general way. The development of self-

awareness and the enhancement of social skills such as listening and negotiating likely have universal applicability.

Based on the above, training policy aimed at furthering the development of adaptability should levy certain specific requirements. It should require the application of general adaptability learning principles which are yet to be determined. These need to be specified based on academic literature, research, and proven performance. The same behavioral scientists and training experts convened to critique the design of an adaptability training experiment could be tasked to develop an initial basis for such principles.

Training policy should also recognize adaptability as a competency that, to a degree that depends on job profiles, enhances every other professional competency. Thus, training policy should require the intentional inclusion of the appropriate aspects of adaptability and its components in the training of every competency, as well as in broader unit or larger training scenarios which encompass a range of competencies.

In order to insure that adaptability training is incorporated in the development of exercises designed to train units at all levels, future training policy should mandate multiple exercises annually which include “crucible experience” training events that require participants to employ all of the cognitive and relational skills in the IDA model. As we found in our original study, individuals and units must be grounded in fundamental skills, but they also need to experience a wide range of training events with frequently shifting tasks and conditions, so that the learner is routinely expected to adapt to new situations and is never allowed to get comfortable in any given set of tasks.¹²⁶ The Australians would call this developing an “adaptive stance.” Some policy steps in this direction probably could be implemented now.

As a corollary to the development of periodic multiple comprehensive “crucible experience” events, training policy should promote greater variety and less repetition in the basic and routine training that teaches and employs the fundamentals of tactics, techniques, and procedures (TTP). This would be consistent with a mastery orientation aimed at developing the comprehensive understanding of TTPs necessary to apply them in novel situations. Based on the work of several researchers which it references, an ARI study describes the advantages of such an orientation:

There is also some evidence that a mastery orientation toward adaptability training might improve adaptive performance. When people hold mastery or

¹²⁶ Tillson, *Learning to Adapt*, p. 35.

learning goals for a task (such as a training course), their main objective is to master the knowledge and processes that underlie performance. These types of goals are in contrast to performance goals, where the main object is to achieve a particular level of performance during training. When people hold mastery goals, they are more likely to look upon difficult training situations as learning experiences, rather than as situations to be avoided because they may interfere with performance. Furthermore, because a mastery orientation involves treating mistakes as opportunities to learn, people with mastery goals tend to get less frustrated in the face of failure than do those with performance goals. This may make them more resilient in maintaining performance out of the training context and under demanding conditions than people learning under a performance orientation. A mastery orientation can be encouraged in training by deemphasizing grades and quantitative performance ratings and focusing instead on providing feedback on how students can leverage their strengths for continuous improvement.¹²⁷

To suggest that a mastery orientation will promote greater adaptability is not to suggest that standards should be lowered for the fundamentals of tactics, techniques, and procedures. Basic technical procedures must be learned as foundational to more complex operations. However, we would suggest that an early disciplined effort to employ those fundamentals in a variety of training scenarios will enhance the understanding of the fundamentals on the part of those being trained and augment their ability to employ those fundamentals in unpredictable situations, thereby increasing the overall readiness and self-confidence of the trainees. Supportive of this idea is the work of Richard Clark and David Feldon with regard to Guided Experiential Learning (GEL). GEL is based on the idea that: “Training and trainers will be more successful if they give strong guidance to trainees when they are in the early stages of learning in a new area of practice. They also need a very long period of application practice so that they can tune and correct their knowledge.”¹²⁸ As Clark and Feldon describe it: “The GEL training system is designed to promote the development of adaptable experts who not only learn to perform in routine situations but also are able to apply their skills and knowledge when conditions change and shift.”¹²⁹ GEL employs “increasingly novel and challenging scenarios,” but recognizes that “Learning how to apply knowledge flexibly in authentic situations requires trainees first learn how to handle routine situations and only then tackle complex scenarios and solve complex problems.”¹³⁰

¹²⁷ Army Research Institute for the Behavioral and Social Sciences, *Training Adaptable Leaders: Lessons from Research and Practice*, Research Report 1844, October 2005, p. 10.

¹²⁸ http://projects.ict.usc.edu/itw/gel/Clark_GEL_Workshop_TRADOC_05.pdf.

¹²⁹ Richard Clark and David Feldon, “GEL, Adaptable Expertise and Transfer of Training,” September 9, 2008.

¹³⁰ Ibid.

Finally, there are numerous tools that might be employed in support of a training policy focused on developing adaptability. Amongst existing DoD programs, JKDDC, JKO, and JNTC all have the potential to support adaptability training. Likewise, many of the actions and methodologies suggested in IDA's draft "Learning Adaptability Strategy (2006) could contribute to adaptability learning. We will reassess those in light of our current findings and the outcome of an adaptability training experiment. However, what needs to be recognized clearly is the difference between the substance of purpose designed adaptability training and the tools employed in delivering the training. In particular, the attractiveness of numerous technologies available for training today should not lead to the promotion of training policies that promote technology at the expense of comprehensive and in-depth training that encompasses all the components of the IDA adaptability model.

VIII. NEXT STEPS & FUTURE RESEARCH

The next steps in our study and in promoting adaptability learning include continuing research on our part with regard to existing adaptability training efforts, the design and conduct of a proof-of-concept experiment, the identification of avenues for future basic research in support of adaptability learning, and the possible presentation of our findings and work in appropriate forums, with an eye toward attracting additional support for the overall initiative of the OUSD(R).

Phase I of our study, which focuses on identifying current adaptability training initiatives, will remain open throughout the study. While the Services have presented what they consider their “best of breed” initiatives, we continue to discover training and education programs in the U.S. military that contribute in a significant way to developing adaptability, or which clearly have the potential to do so. Similarly, we continue to find adaptability-related training and education programs in the private sector and in foreign militaries. We will continue to search for and evaluate such programs and will use our findings in developing a proof-of-concept experiment, in developing a training strategy framework, and in identifying possible revisions to current DoD training policy that will promote the development of adaptability.

The IDA study, to date, has served as a catalyst by bringing together organizations interested in developing viable adaptability training programs. The symposium we facilitated in December 2007 was particularly useful in this regard, but each visit and meeting since then with organizations not included in that symposium has led to new contacts and introductions and the potential for cooperation that will focus scarce resources on this important endeavor. We would anticipate that the broad existing network in the field of adaptability learning that we have discovered, and which the resources available to this study are helping to expand, will be a significant factor in mustering the talent and energy necessary to move adaptability learning from the realm of academic theory, research and the teaching of components of adaptability to the teaching and training of adaptability as an essential metaskill in the military operating environment.

Clearly, the next major step is to assist OUSD(R) in overseeing the design and execution of an experiment, or series of experiments, which will provide a proof-of-

concept with regard to the hypothesis that adaptability performance can be improved through purpose-designed training or other developmental interventions. We recommend that, if possible, an organization with experience both in researching adaptability learning theory and in designing and conducting adaptability-related training be identified to coordinate the design and conduct of the experiment.

We also recommend, early on in the planning process, convening a manageable size workshop of behavioral and social scientists and training leaders from each of the Services. The purpose of the workshop will be to conduct a critical review of the plan developed by the design organization and to gain consensus on the key elements of the experiment, particularly the metrics which will be used to measure whether adaptability performance has been improved by the training experience of the experiment. This workshop should also address the important question of how best to provide an independent assessment of the experiment's results.

An important consideration of the organization designing and conducting the experiment will be the choice of a suitable venue for the experiment. To date, the purpose designed adaptability training we have identified has been directed toward Special Forces personnel and Civil Affairs and PSYOP personnel. It would be tempting to simply build on these efforts. However, a more useful venue would likely be one that has the potential to demonstrate that the broad range of general purpose forces can be trained to be more adaptable. It was, after all, the finding of our original study that, given the unpredictable nature of threats for the foreseeable future, the key skill that all individuals, units, and teams of commanders and leaders need to learn is adaptability. Thus, the results of an experiment which focused on a small segment of the military, specifically Special Forces whose members are selected based to some degree on their perceived higher aptitude for adaptability, would not have the same significance or produce the same weight of argument as would those of an experiment directed toward a broader cross-section of the military that contains individuals with more typical aptitudes for adaptability.

Therefore, we looked at options for the initial experiment focused on relatively junior individuals or small units at the tactical level. These appear to be the most manageable. But there are certainly other possibilities, including the Provisional Reconstruction Teams and the Military Transition Teams. Their work clearly requires all the elements of adaptability, and their current training does little to develop that capacity.

Our initial study articulated the importance of providing adaptability learning initiatives at every stage of an individual's career and for every size unit and commander/leader team. Therefore, it will be important as this effort progresses to explore possibilities for and experiment with initiatives designed to train more senior officers and non-commissioned officers, large staffs, and larger units. An example of possibilities in this area was an earlier proposal by JMW Consultants, Inc. to conduct an approximately nine month adaptability training program for one unit, commanded by an O-5, in each of the four Services.¹³¹ We recognize that such an effort would be expensive, but we are hopeful that the results of initial more modest initiatives will encourage the expansion of adaptability training in ways that will help foster a culture of adaptability within the DoD.

As indicated above, we will continue to explore possible sources of adaptability learning experience—military schools, training sites, academic institutions, and commercial learning centers. Based on our research to date, we believe that there is potential for adaptability learning in ongoing training and education by the Army at Fort Bragg, Fort Benning, Fort Knox, Fort Leavenworth, and the National Training Center at Fort Irwin, and by the Marines at Quantico, Camp Pendleton, and 29 Palms. The positive experiences of our visits to the Institute for Creative Technology and the Center for Creative Leadership lead us to believe that we will benefit from identifying and visiting similar organizations. Contacts with individuals in or associated with foreign militaries suggest strongly to us that we may profit from work done in the past or currently being accomplished in Israel and Australia, in particular, and possibly in other countries as well.

Beyond our efforts to identify potential adaptability learning venues, we will continue to research findings from assessments of adaptability-related training programs, review published methods for assessing adaptability itself, and attempt to find or distill principles for designing training programs intended to enhance the adaptability of individuals and teams. As we conduct this research, we will continue to review the IDA model of adaptability and consider possible revisions or refinements that would add conceptual clarity.

As part of our initial research, we attended the Interservice/Industry Training, Simulation & Education Conference (I/ITSEC) in November 2007. That allowed us to become familiar with simulation and gaming technologies that might be employed

¹³¹ Tillson, *Learning Adaptability Strategy*, IDA Draft, May 2006, Enclosure 9.

effectively in adaptability training. It also allowed us to meet with individuals from industry who are capable of supporting the type of training we are proposing be developed. We have followed up with a number of those people in order to understand the capabilities they have developed to date. It appears clear to us that industry can produce adaptability training tools in various technical formats, if it is provided sufficient guidance on the requirements. The development and conduct of a proof-of-concept experiment should help to identify some initial specific requirements. Because of the size of I/ITSEC and the range of talent and resources that it attracts, we believe that it might be a suitable venue for presenting this study and soliciting support in the future. Introducing adaptability training initiatives at that conference could well provide a catalyst to further industry initiatives. Should sufficient progress be made in the next few months with regard to developing an experiment, the 2009 conference might be an appropriate time to make such a presentation.

Every visit and all of our reading of adaptability-related literature has led us to an ever-expanding body of work on subjects directly related to this study. The teaching and training of adaptability requires not only a comprehension of the substance of the various components of adaptability, but an understanding and appreciation of the science of learning and behavioral science. In parallel with every other aspect of this study, we will continue to mine the relevant literature, particularly academic research literature, and assimilate it to the extent practical in order to inform the development of an experiment, an approach to an adaptability training strategy, and recommendations for modifications to DoD training policy that will promote the development of adaptability across the force.

A specific example of academic work recently brought to our attention and which deserves further study on our part is that of Dr. Robert J. Sternberg. A leading experimental psychologist and currently Dean of the School of Arts and Sciences at Tufts University, Dr. Sternberg has, based on extensive empirical research, developed a triarchic theory of human intelligence. His triarchic model includes analytical intelligence (the ability to complete academic, problem-solving tasks), creative or synthetic intelligence (divergent thinking and the ability to deal with novel situations), and practical intelligence (the ability to apply knowledge to the real world, to shape one's environment). While recognizing that Dr. Sternberg is not without critics, his model of intelligence appears clearly to be relevant to the IDA model of adaptability. In addition, Dr. Sternberg purportedly has developed ways to improve both creative and practical intelligence, as well as measures for the three aspects of intelligence. Further study of his

work may reveal effective methods of training components of adaptability and the means to measure changes in adaptable behavior.

An example of academic work which we have studied but which requires further research is that concerning Naturalistic Decision Making. In our original study, we drew heavily on the work of Gary Klein, particularly with regard to the concept of intuition. As discussed above, one of the reviewers of this paper points to the writing of Klein and others in the area of Naturalistic Decision Making and Cognitive Task Analysis (CTA) as a source for metrics that have been developed to measure adaptability defined as a skill set within a specific context. We will be particularly interested in investigating the relevance of such metrics to the IDA model of adaptability. We also intend to pursue the relationship between expert decision making in “tough cases” studied by Klein and others¹³² and the complex decision making research of Dietrich Dorner and Anne-Marie Grisogono that is fundamental to the Australian Army’s Adaptive Campaigning.¹³³

Because the work of Dorner and Grisogono has been so influential in causing the Australian Army to adopt the concept of Adaptive Campaigning, we think it particularly important to understand the underlying theory of that work and to try to learn why it has been so persuasive. As initially presented to us in conversations and a short briefing, adaptive campaigning is based on a nuanced definition of adaptivity that includes, among other aspects, classes and levels of adaptivity. It should be particularly instructive to compare that definition to the IDA model of adaptability, to ascertain the difference between adaptivity and adaptability, and to determine whether the definition of adaptivity provides greater insight into potential methodologies for training adaptability.

While we have continued to uncover an expansive body of adaptability-related literature, we have also come to recognize the need and opportunity for further research that can inform efforts to develop effective interventions aimed at developing adaptability. Such research would address a variety of questions.

One set of such research questions was well articulated by a group of researchers in a paper presented at the Army Science of Learning Workshop in 2006. The group posed eight specific adaptability-related research questions, including questions dealing

¹³² Beth Crandall, Gary Klein, Robert, R Hoffman, *Working Minds: A Practitioner’s Guide to Cognitive Task Analysis*, Cambridge, MA (MIT Press, 2006), p. vii.

¹³³ Dietrich Dorner, *The Logic of Failure*, Cambridge, MA (Perseus Books, 1996). Grisogono, Anne-Marie, Research Leader, Complex Adaptive Systems for Defence, Australian Department of Defence, Meetings with IDA and OSD personnel, Washington, D.C., October 6, 2008.

with effects of leadership and organizational structure on adaptability. One question was particularly relevant to adaptability training:

What are the best models and instructional strategies for training adaptability skills, and to what degree can adaptability be developed?

Different training models may be needed for different types of adaptability (e.g., cognitive, physical, cultural, interpersonal, leadership). Moreover, it is likely that certain individual differences (e.g., cognitive ability) place boundary conditions on the extent to which individuals can be trained to adapt.¹³⁴

In a more theoretical vein, Greenspan and Shanker, two recognized authorities on human development, in their book *The First Idea* essentially categorize what we describe as adaptability as being the highest level of meta-cognitive ability development.¹³⁵ Research could help to identify how individuals progress from lower stages to higher stages of adaptability and what training interventions would speed progress. Similarly, Professor K. Anders Ericsson argues, based on his research, that excellence and expertise is relatively less dependent on inborn capacities and innate talent and more a result of abilities and skills attained through continual disciplined work and practice.¹³⁶ If this is so, then there would appear to be a fertile field of research in identifying the lower level abilities and skills that are required to be mastered and combined to achieve the higher level skill of adaptability, as well as the most effective ways of practicing those skills.

Perhaps the most necessary and potentially fruitful area of research is metrics. As discussed above, one reviewer of this report has suggested a source of adaptability metrics. However, in our research of the literature related to adaptability, in exchanges at the symposium we conducted with the Services in December 2007, and in discussions with numerous academic experts, we found very little in the way of metrics that measure adaptability or progress in achieving adaptability. Ideally, it will be possible to develop metrics for the metaskill of adaptability. Alternatively, it may be necessary to measure adaptability indirectly through its components—intuition, critical and creative thinking,

¹³⁴ David Dorsey, Rose Mueller-Hanson, Elaine Pulakos, *Adaptability and Adaptive Performance: Current Findings and Future Directions for Building Adaptive Forces*, Paper prepared for the 2006 Army Science of Learning Workshop, Hampton, VA, July 15, 2006, pp. 15.

¹³⁵ Greenspan and Shanker, *The First Idea*. See pp. 421-423 for discussion of adaptive processes enabled by the development of a combination of cognitive and relational elements [of adaptability] in a society (to high meta-cognition) that allow it to adapt and progress to higher development levels. Also on p. 425 they argue that to adapt to current challenges we must “ascend to a still higher level of reflection and empathy than has been attained in even the most advanced cultures.” ... that would allow “a decidedly more adaptive” approach to the challenges.

¹³⁶ K. Anders Ericsson, “Attaining Excellence Through Deliberate Practice: Insights From the Study of Expert Performance,” in *The Pursuit of Excellence Through Education*, ed., Michel Ferrari (Mahwah, NJ: Lawrence Erlbaum Associates, Inc. 2002).

self-awareness, and social skills. However, even that will be difficult. Adding to the challenge, one reviewer of this paper noted that "...the [IDA] model operates holistically and therefore both process and function and qualitative and quantitative measurement is essential."¹³⁷ Regardless of the approach taken, it is important to underscore the importance of metrics to gaining the support needed to devote resources to both their continued development and new approaches to training that they support. Adaptability is recognized as a key metaskill necessary to operate effectively in the current operating environment. Significantly enhancing that skill will require positive interventions. Determining the effectiveness of the various interventions that may be considered will require metrics, as will making the case for devoting resources to the interventions in the first place.

One novel idea for measuring adaptability performance involves the analysis of physiological performance and brain function. We observed an example of a system that might be employed in this manner at I/ITSEC 2007. The Naval Air Warfare Center Training Systems Division exhibited the Cognitive Avionics Toolset (CATS), which works in conjunction with the Advanced Tactical Aircraft Simulator (ATAS) and Common Distributed Mission Training Station (CDMTS) to measure a pilot's technical and physiological performance during high task demand situations. It would seem logical that such a system might be used to measure performance in other stressful situations, thereby providing a tool to measure how an individual's adaptive performance changes as a result of various training interventions. Similarly, Dr. John Cowan has developed a system called the Peak Achievement Trainer (PAT) EEG, which traces electrical activity in the brain and provides neurofeedback designed to enhance cognitive performance.¹³⁸ This system has been employed to improve performance at West Point and has been introduced in the Army's Centers for Enhanced Performance. Recognizing that practical employment of such technology is probably, at best, years away, we encourage continued research with these and similar programs, for both the purpose of conducting adaptability-related training and for the purpose of measuring the effectiveness of such training.

On a more theoretical level, we believe that additional exploration of work in the field of neuroscience may well contribute to the design of adaptability training. One reviewer of this paper has pointed us in a specific direction, noting:

¹³⁷ Patricia Romano McGraw, review of *Developing an Adaptability Training Strategy and Policy for the DoD* (draft), IDA Paper P-4358, Institute for Defense Analyses, August 15, 2008, p. 13.

¹³⁸ <http://www.peakachievement.com/factsheet.htm>.

Brain/behavior relationship analysis will help anchor the training plans into “reality” meaning the way things really work on the job...While the neurological support for a “whole brain” model of a human being is strong and at this point incontrovertible, the brain does develop various systems and subsystems that function to handle certain tasks that emerge in the context of various demand characteristics of the environment. I will call these subsystems “states of mind.”...The “warrior” state of mind would be a different behavioral repertoire than that for the same soldier who is called later to act as a peacekeeping emissary and to hand out food to the refugees. *States of mind are learned and therefore can be taught.*¹³⁹

Formulating purpose-designed adaptability training at every level will not be easy, but it seems highly possible that an enhanced understanding of neuroscience could contribute to its development.

Throughout our study to date, we have sought the advice of experts in the various scientific fields which have made contributions to adaptability-related training or which have the potential to do so. As we progress, we will continue to vet our findings and recommendations with experts in academia, research organizations, and other groups doing similar work under DoD sponsorship.

Finally and as can be seen from what we have written above, attempting to complete the subtasks in the task order sequentially would be impractical and, indeed, counterproductive. This is due both to the time it will take to develop and conduct an experiment and to the interrelated nature of the subtasks. Moving forward will be a spiral process in which each subtask will inform the others, with all progressing simultaneously.

¹³⁹ Patricia Romano McGraw, review of *Developing an Adaptability Training Strategy and Policy for the DoD* (draft), IDA Paper P-4358, Institute for Defense Analyses, August 15, 2008, pp. 11-12, 14. Based on Siegel, D., *The Developing Mind: How Relationships and the Brain Interact to Shape Who We Are*, New York, NY: The Guilford Press, 1999.

Appendix A
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Appendix B
FEDBIZOPPS REQUEST FOR INFORMATION

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Request for Information (RFI)

Introduction

This publication constitutes a Request for Information notice and no formal Request for Proposals (RFP), solicitation, and/or additional information regarding this request will be issued. The Office of the Under Secretary of Defense (Personnel & Readiness) will not issue paper copies of this request.

Recognizing that asymmetric warfare will be the most likely means that potential enemies will continue to employ in their efforts to challenge U.S. interests, the Office of the Under Secretary of Defense (Personnel and Readiness) (OUSD P&R) previously tasked the Institute for Defense Analyses (IDA) to study how the military should train to combat asymmetric threats. IDA concluded that, because of the unpredictable nature of such threats, the military should emphasize the development of adaptive leaders, units, and commander/leader teams. In a new follow-on study, OUSD P&R has requested that IDA provide support in the development of an adaptability training strategy. As an initial part of that study, IDA will conduct an analysis of current adaptability training initiatives of the military Services, other government agencies, and private industry.

Definitions

To clarify what is meant by “adaptability training,” a definition of adaptability is required. The IDA study agreed with a report by the Army Research Institute which defines adaptability as “an effective change in response to an altered situation.” Thus, when looked upon as a skill, adaptability can be understood as the ability to recognize an altered situation and to conceive and produce an effective response to that altered situation. Adaptability, while considered a skill in itself, was further decomposed for the purposes of the IDA study as a function, first, of the cognitive skills of *intuition* and *critical and creative thinking* and, second, of the relational skills of *self-awareness* and of *team social skills*.

- *Intuition*, as defined by Gary Klein, author of The Power of Intuition, is “the way we translate our experience into action.” Intuition is the process by which one recognizes how a given situation fits a particular pattern and makes corresponding decisions about how to react to that situation. Studies have shown, with or without training, that is what leaders do.
- *Critical and creative thinking* are understood to be interrelated and complimentary aspects of thinking. Critical thinking, a widely used term, has been simply defined by Air Force Colonel Michael Guillot as “the ability to logically assess the quality of one’s thinking and the thinking of others to consistently arrive at greater understanding and achieve wise judgments.” Creative thinking most often relates to innovation and requires imagination,

originality, and flexibility. Most education institutions advertise the development of critical thinking as a primary goal

- *Self-awareness* relates to a realistic assessment of one's own abilities that allows the individual to play to his or her strengths while remaining aware of his or her weaknesses. Self-awareness includes an individual's understanding of how he or she is perceived by others and contributes directly to one's ability to work effectively with others and as part of a team.
- *Team social skills* are simply those skills that allow groups of individuals to work together effectively. The Consortium for Research on Emotional Intelligence in Organizations has identified one representative sample of key social skills which adaptive leaders and leader teams require. A number of those skills involve social awareness—a parallel to self awareness. These include empathy—an understanding of and interest in the concerns of others, service orientation—a commitment to the needs of those being served, and organizational awareness—recognition of the key relationships and dynamics within the group. Other social skills involve the ability to lead and manage within a group. They include the ability to inspire others, to help others develop their own skills, to initiate and manage change, to manage conflict, to influence others to agree with a position or proposed action, and to build relationships that contribute to creating a shared vision and desire to work collaboratively.

Purpose

The purpose of this REQUEST FOR INFORMATION (RFI) is to obtain information concerning existing training and education programs being employed in industry, academia, and other government agencies that are designed to develop and enhance adaptability skills and the four components thereof as defined above.

All information received will be provided to IDA for use in its assessment.

General Information

1. Requesting Agency Name
Naval Air Warfare Center
Training Systems Division
Orlando, Florida
2. Request for Information Title:
Initiative to Support Adaptability Training Throughout the Department of Defense
3. Request for Information Number:
4. Response Date:
Information Papers: 15 October 2007
5. Request for Information Description:
Respondents are encouraged to provide information concerning one or more of the following:
 - Methodologies being used to train leaders and leader teams to recognize an altered situation and to conceive and produce an effective response to that altered situation.

- Methods being provided to leaders or leader teams in order to increase the reliability of their intuition and their confidence in their decision-making processes.
 - Education and training methodologies designed specifically to foster critical and creative thinking, as well as metrics being used to measure the development of critical and creative thinking skills.
 - Methods currently being employed to develop self-awareness of leaders.
 - Training methodologies designed to develop team social skills in groups accustomed to working under pressure to meet changing requirements in an uncertain environment.
6. Points of Contact:
Questions shall be directed to, as specified below:
Benn Aaronson
Acting Deputy Director,
Cross-Warfare Programs
NAWCTSD
12350 Research Parkway
Orlando, FL 32826-3275
E-mail: benn.aaronson@navy.mil
Voice 407-380-8250, FAX (407) 380-4442, DSN 960

Application and Submission of Information

1. Application and Submission Process:
The due date is no later than 4 PM (Local Eastern Time) on 15 October 2007.

The Government will not reimburse any costs associated with the development and submission of materials in response to this request.

The papers submitted in response to this notice are expected to be unclassified. The submitted responses will be protected from unauthorized disclosure in accordance with FAR 15.207, applicable law, and DoD/DoN regulations. Submitters are expected to appropriately mark each page of their submission that contains proprietary information. Responses will not be disclosed outside the Department of Defense and IDA without the submitter's written authorization.

2. Address for the submission of Information Papers:
Benn Aaronson
Acting Deputy Director,
Cross-Warfare Programs
NAWCTSD
12350 Research Parkway
Orlando, FL 32826-3275

Electronic file transmissions are encouraged. Send e-mail responses to the following e-mail address: benn.aaronson@navy.mil



NOTE: RESPONSES SENT BY FAX WILL NOT BE CONSIDERED.

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Appendix C
OSD (P&R) ADAPTABILITY SYMPOSIUM BRIEFINGS LIST

OSD (P&R) ADAPTABILITY SYMPOSIUM BRIEFINGS LIST

Slide 1





OSD (P&R) Sponsored Adaptability
Symposium
11-12 December 2007

Service Briefings

If CD is missing, it is available from the authors

Bill Burns wburns@ida.org
or
Waldo Freeman wfreeman@ida.org



Slide 2



Army Briefings

- Adaptability: Research Concepts and Findings. Dr. Stanley Halpin, ARI
- Adaptive Leaders Methodology (Applied). LTC Max Padilla (ret) & MAJ Don Vandergriff (ret), USA Accessions Command
- DoD Adaptability Initiatives. COL Gary R. Hisle, Jr., Combined Arms Center
- Non-Cognitive Predictors of Soldier Adaptability and Performance. Dr. Michael D. Matthews, USMA
- Adaptability Learning: Instructional Development Revision and Problem-Based Learning. Dr. Bob Bauer, USAARMC
- Training System Approaches for Honing Adaptive Thinking, Cultural Awareness and Metacognitive Agility. Dr. Elaine M. Raybourn, Sandia National Laboratories.
- Strategic Thinking within the Context of Adaptability. Dr. Richard Meinhart, Army War College
- Adaptability Learning Symposium. William M. Darwin, Asymmetric Warfare Group

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Navy Briefings

- Battle Stations 21: The Future of Navy Performance. Rodney A. Chapman, Naval Service Training Command
- Adaptability Training in Computer Network Operations (CNO). CTNCS(SW/SS) Christopher J. Dunford, Center for Information Dominance
- Adaptability Training in Naval Intelligence. Dr. Bud Livers, Center for Naval Intelligence
- Adaptability, Self-Awareness, & Organizational Analysis. CDR James S. Pfautz, Center for Naval Leadership
- Adaptability Training. Mr. Robert Taylor, Navy Expeditionary Combat Command
- Critical Thinking @ USNA. Dean Michael C. Halbig and CAPT Robert J. Niewoehner, USNA



USMC Briefings



- Adaptability Training or “Marine Corps Philosophy on Warfighting.” LtCol Travis A. Tebbe, USMC Training and Education Command (TECOM)
- Simulation to Develop Adaptable Marine Leaders. Mr. Donald J. Mathes, TECOM Technology Division
- Marine Corps Tactics & Operations Group (MCTOG). LtCol Timothy E. Barrick, MCTOG
- Marine Corps University: Educating Adaptable Leaders for an Unpredictable Future. LtCol Jay L. Hatton, Command and Staff College, and Dr. Wray R. Johnson, School of Advanced Warfighting



AF Briefing

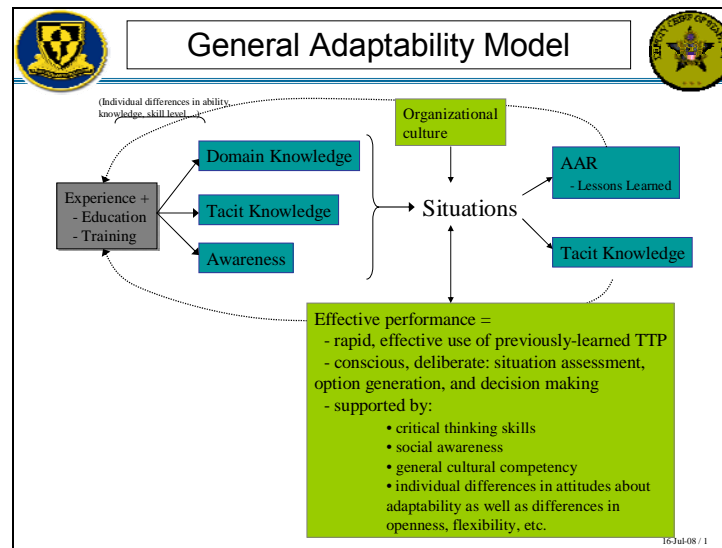


- OSD Adaptability Learning Symposium: Air Force. Dr. Patricia F. McGill, Headquarters USAF (AF/A1DI)

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Appendix D
HALPIN ADAPTABILITY DEVELOPMENT MODEL

HALPIN ADAPTABILITY DEVELOPMENT MODEL



Younger, less experienced leaders seem more likely to believe that if they “do things right,” then they will succeed. More experienced leaders seem more willing to accept the need to be adaptive.

Organization leadership and culture issues include:

- clear communication and understanding of commanders’ intent
- attitude towards errors (e.g., “zero-defects” mentality)
- tolerance of unplanned (adaptive) actions by subordinates
- presence of a learning culture


General developmental principle: complex behaviors like adaptability are not well suited to a training solution. Need an educational setting with competent instructors who themselves get it, who can provide feedback/guidance/mentorship across many repetitions. In-unit learning can also be effective if there is a culture of openness and willingness to learn, plus honest AAR’s and competent mentor.

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Appendix E
THINK LIKE A COMMANDER BRIEFING

THINK LIKE A COMMANDER BRIEFING


Slide 1

**U.S. Army Research Institute**

**Training Adaptive Thinking with
Think Like a Commander**


Dr. James Lussier
Chief, Fort Bragg Scientific Coordination Office
U.S. Army Research Institute
910-432-6833 Ext. 316 DSN 239
james.w.lussier@us.army.mil

Slide 2

**Purposes of Briefing**

- To describe the Think Like a Commander (TLAC) program.
- To describe a method that has proven to be very effective in training complex cognitive skills.

Slide 3




Military Adaptive Thinking Defined

Thinking that supports:
making adjustments in an unfolding plan under the
dynamic conditions of military operations.

Adaptive thinking:


- is not knowledge; it is a behavior.
- is not a generic or portable ability; it arises from specific knowledge and experience in the domain.
- is not a personality trait; it is a trainable skill.

Slide 4




Deliberately Training Behavior

**Activities Specifically
Designed to Improve
Performance**



- Identify desired elements for expert form
- Learner performs while attending to element
- Coach notes discrepancies from expert form
- Behavior is repeated until habitual
- Performance without attending to element


Slide 5



Expert Patterns of Battlefield Thinking

- Keep a focus on **mission accomplishment** and **higher commander's intent**.
- Model a **thinking** enemy.
- Consider effects of **terrain**.
- Use **all elements/systems** available.
- Include considerations of **timing**.
- Exhibit visualizations that are **dynamic** and **proactive**.
- Consider **contingencies** and remain **flexible**.
- Consider how your fight fits into the **bigger picture** from friendly and enemy perspectives.

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Think Like a Commander Method

Cognitive Battle Drills

Allow officers to model their battlefield understandings, plans, visualizations, and decisions after expert tacticians' thinking patterns.

Case-based
Performance oriented
Theme-based coaching
Probes facilitate observation & measurement
Repetitive performance - varying conditions
Aimed at ingraining expert habits

Slide 7




Think Like a Commander - Classroom

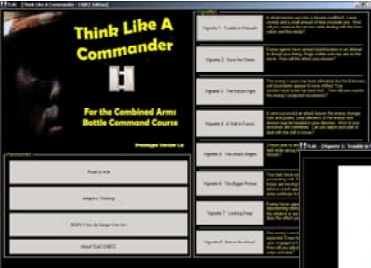
Live instructor
with small group
instruction



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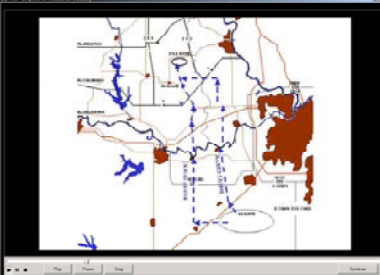


Overview of the Training Method




1 Students select a vignette.

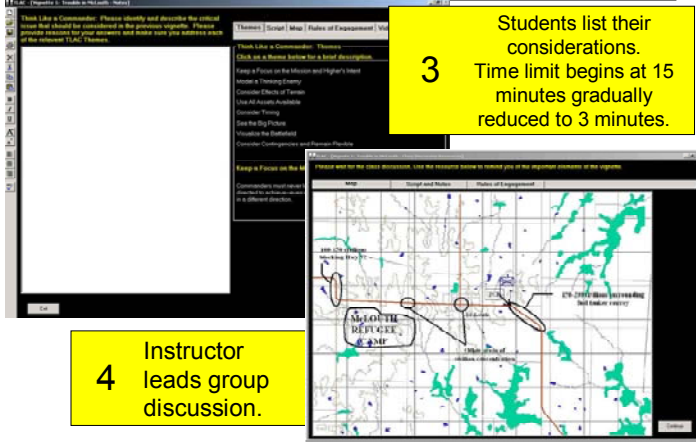
2 Battlefield situation is presented.



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Overview of the Training Method



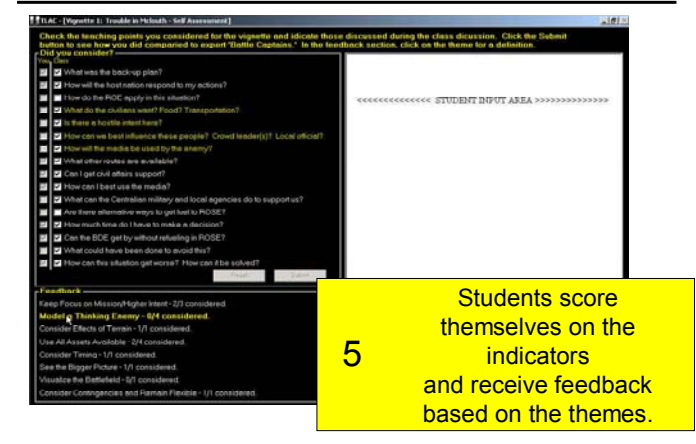
3 Students list their considerations. Time limit begins at 15 minutes gradually reduced to 3 minutes.

4 Instructor leads group discussion.

Slide 10

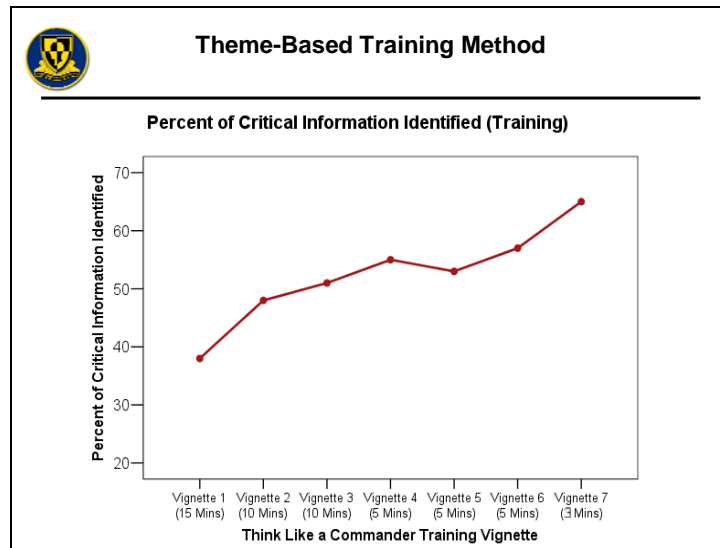


Overview of the Training Method




5 Students score themselves on the indicators and receive feedback based on the themes.

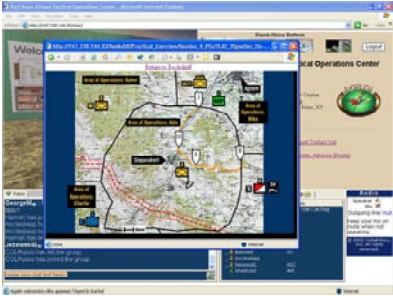
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Slide 12

 **Think Like a Commander - Distributed**

Live instructor on
a collaborative
network



Slide 13

**TLAC in the ACCC-RC
Student Comments**

“... was a combat leader’s reaction course for the mind.”

“... makes you ask the hard question of WHY things are occurring.”


“... vignette has real world application to what we are doing right now in Iraq. TLAC makes you think and consider things that you might miss.”

“... gets you into a decision making mindset.”


“... helped me focus on details of COA Analysis.”

“... made me think of questions I would ask my platoon leaders.”


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**Think Like a Commander - Instructorless**

Automated
Coach







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Internet Delivered Training

- General Wallace expressed a need to make training more accessible using distance learning (dL) methodologies.
- To address that concern we are developing an Internet-delivered version of the Captains in Command training for Mounted ManeuverNet.
- Timeline:
 - OCT 06: dL enabled vignettes.
 - NOV 06: Draft Captains in Command training site.
 - DEC 06: Final Captains in Command training site.

Will make the training more accessible to MCCC students.




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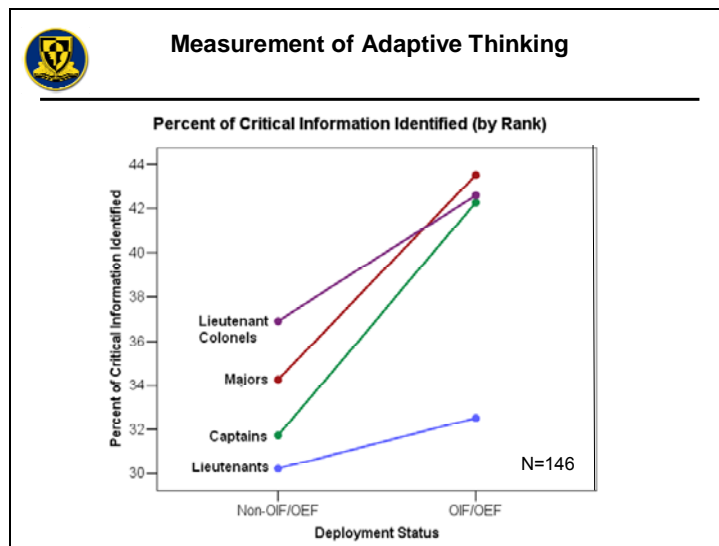
Focused Training in Adaptive Thinking

- Participants included 24 Officers enrolled in the Armor Captains Career Course at Fort Knox, KY.
- None of the participants had OIF/OEF experience.
- Participants received about 8 hours of Think Like a Commander Training in addition to standard program of instruction.

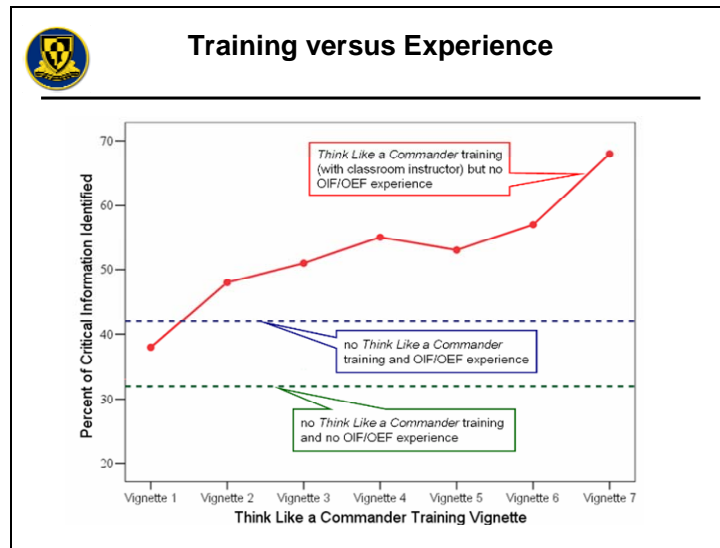


Measurement of Adaptive Thinking Skill

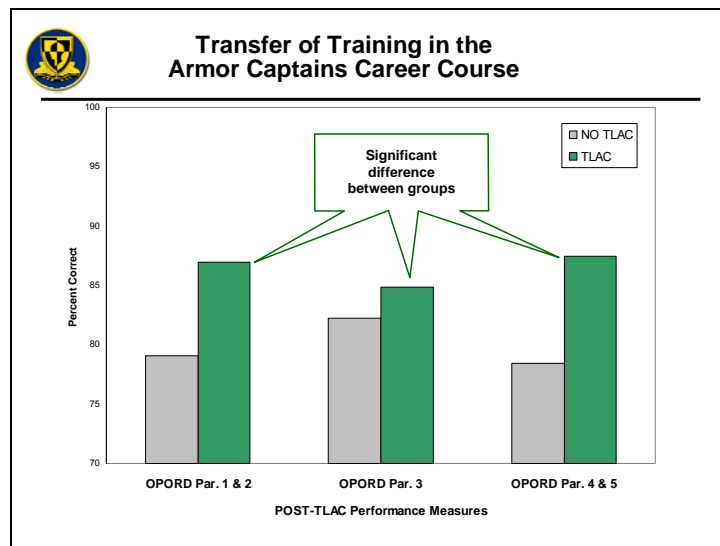
- Participants include 118 U.S. Army officers of various ranks, about half with OIF/OEF deployment experience.
- Measurement involves a series of situational judgment tests involving tactical situations ranging from stability and reconstruction to high intensity combat operations.
- Participants must rapidly (10 min. time limit) size up tactical situations and identify critical factors.
- Scored against an expert-generated list of key considerations of the tactical situation.



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Appendix F
CLE DOCUMENTS



Combat Leader Environment (CLE)

Experience in Iraq and Afghanistan has taught the Army and Marine Corps that the center of gravity for future wars will be at the tactical level. All too often in these conflicts very junior leaders, mostly at the squad and platoon level are obliged to learn the art of close combat decision making once close combat begins. This is clearly too costly in human life. The Army understands the need for a means of “steepening the learning curve bloodlessly.” GEN Scott Wallace, TRADOC Commander has expressed a desire for the Army to develop what he calls a leader’s UCFT, or a device that offers small unit leaders the opportunity to practice battle command during train up for deployment.

Fortunately the human sciences have advanced to the point today where such a device and method for training young leaders in battlefield decision making is possible. The Combat Leader Environment is the outcome of this effort.

A CLE facility includes a mock up of a command vehicle surrounded by a realistic and infinitely variable terrain and human environment projected on to a surrounding screen. The evaluated leader is connected to a set of observer controllers and monitors, both real and virtual, who prompt action using both visual and voice stimulations. Riding with him is a mentor who observes and uses his skill as a behavioralist to occasionally interrupt the exercise to discuss key decisions made by the evaluated soldier.

The CLE is far more than a training device. It represents an entirely new way of teaching leadership based on cutting edge behavioral science. Behavioral science teaches the value of repetition as the first requirement for making better decision makers. The CLE is designed to offer cheap repetition. It allows a young leader to experience an infinite variation of complex and demanding decision making situations over and over again. Varied repetition prevents the leader from applying rote learning and forces him to focus on using his intuitive faculties rather than rigid adherence to rules.

The CLE is a synthetic fully immersive environment that allows a leader to momentarily “suspend reality” such that he experiences as much stress and uncertainty that simulated combat can provide. The simulation also offers a learning “rheostat” that permits an evaluator and coach to vary the intensity and complexity of each experience so that the leader can accelerate his skill and reach ever greater degrees of competence.

While the simulator is important to the making of better decision makers the evaluation and mentoring regimes of the CLE are equally important. Lockheed Martin has developed a series of exhaustive beginning assessments and measurements based on sound psychological instruments that help to establish a learning baseline from which the mentor can chart progress. The mentor-coach is the key to a successful decision making experience. The mentor knows the science. He monitors the learner’s progress and routinely interrupts the simulation to coach and redirect the learner. The CLE is sufficiently flexible to allow the mentor to tailor each iteration of the exercise to ensure that the mentor has the tools he needs to chart, assess and “make the decision maker better over time.”

The CLE comes with the training and research materials to assist the mentors and coaches to perform their tasks professionally. They receive a Green Book that gives not only the “situation” but also the human characteristics of the characters, both enemy and friendly, that the learner must know intimately to make decision based on personality and expected behavior.

The CLE incorporates the latest after action review (AAR) procedures in to each exercise. The mentor uses the AAR as a means to imbed the leader’s experience and to coach him in how to practice between exercises. Once the CLE is proliferated throughout the Army each junior leader will have the opportunity to repeat many immersions over many years. The need result will be a cadre of junior leaders who will develop the intuitive ability to see, sense and react brilliantly to close combat situations without ever having to face the prospect of their initial learning to be on the job in combat.

The CLE generation of young leaders will revolutionize the skills of our junior leaders. Experience in Iraq and Afghanistan has taught us painfully that competence in the close fight is more a function of how well a leader acts and thinks “in extremis” that is at the point of

death. Certainly no device can replicate the fear and horror of a tactical action but it can inoculate a young leader to the complexities of decision making in these situations. But the CLE experience cannot be a onetime thing. Many repetitions experienced over many years will be needed to give our leaders the right stuff they will need to survive on tomorrow's battlefield.

The CLE is the most significant leader development and decision making tool ever developed to date. It allows combat leaders to fight a hundred battles without danger, before fighting the first one for real.

Outcomes

At the completion of CLE sessions, the learner has developed a sense of how to respond to novel or unique situations that are typical of the operating environment. Each Leader has improved his decision making and problem solving abilities based on the coaching, feedback and reflection that has taken place. The learner is prepared to demonstrate these skills in more complex collective training settings.

Success Criteria

- Learners' anecdotal feedback will endorse the CLE as an effective training environment that can be customized to support leader development and to improve battle staff performance.
- Decision makers will request the installation and operation of CLE capabilities to support pre-Mobilization, post- Mobilization, Home Station Training and in-theater leader development.
- CLE will be part of the joint reception, staging, onward movement and integration (CJRSOI) and in-theater training.
- CLE will augment mission rehearsals and planning activities.
- CLE and other bundled training services will be in the 2009/2110 POM and supplemental.

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Appendix G

ADAPTABILITY TRAINING PROOF-OF-CONCEPT EXPERIMENT

ADAPTABILITY TRAINING PROOF-OF-CONCEPT EXPERIMENT

Goal: Demonstrate that purpose-designed training can improve adaptive performance in a specific operational domain (e.g. ground tactical)

Background: A 2005 OSD (P&R) sponsored IDA study identified adaptability as the key meta-cognitive capability required by individuals, teams and units at all levels in asymmetric warfare. The ongoing follow-on IDA study determined significant Service interest in improving adaptability in individuals, teams and units, but no consensus on how to do it including through training,. The Army has conducted the most research in this area but so far has not demonstrated comprehensive purpose-designed training with metrics that indicate performance is enhanced. However a few years ago the JFK Special Warfare Center and School (SWCS), with the assistance of the Army Research Institute (ARI), designed a training module intended to enhance the adaptability of Special Operations Forces trainees including Civil Affairs (CA). Although unfortunately follow-on metrics were never funded, anecdotal evidence appears to validate the utility of the training. More recently some Army officer training has been modified to include significant aspects of what the IDA study indicates should make up adaptability training.

OSD (P&R) agrees with the IDA conclusion that adaptability training should be enhanced throughout DoD but believes that before promulgating policy to that effect it must be demonstrated conclusively that such training actually works. Therefore a proof-of-concept experiment with appropriate metrics is important to give policy a credible foundation, gain buy-in from the Services, and validate the principles that underlie the training. IDA has identified the need for an expert workshop to frame an experiment and provided five possible approaches (attachment) to executing it that could be the basis for a workshop. The Army has expressed interest in the OSD proposal and has agreed to support the concept.

Concept: The experiment would include, but not be limited to, the key elements of such an experiment (attachment) identified thru ongoing IDA research. It would incorporate the corporate knowledge and lessons learned from the adaptability training at the SWCS (especially the Civil Affairs variant) and the related improvements in basic officer training at Ft. Benning and Ft. Knox as well as advances in modeling and simulation to produce purpose-designed adaptability training with supporting metrics. The Army or a contractor with Army (and possibly joint) support would then conduct the experiment. Approximate phasing would be:

- Phase 0: Conduct an OSD P & R sponsored, IDA facilitated, cross-service R&D planning session (workshop) with the leading behavioral and social scientists from each of the Services. Develop outline experiment concept, milestones and resources requirements. 4Q FY '08

Phase 1: Assess adaptability training at SWCS for guidelines. Determine which aspects of the SWCS adaptability training can be generalized to GPF tactical training. Assess the best Army Officer POI for aspects of the training that enhance adaptability. Simultaneously develop job-related adaptability requirement profiles for the intended trainee group. 2Q FY '09

Phase 2: Incorporating the phase 1 results design detailed experiment plan (supported by appropriate M & S technologies) and delivery instruments, including specific POI, with suitable proof-of-concept metrics that will be the basis for an experiment. 4Q FY '09

Phase 3: Conduct the proof-of-concept experiment by conducting training for the appropriate group with the needed experimental elements incorporated into the POI. Ensure detailed evaluation and measurement of the experiment to determine whether adaptability has been enhanced and to what degree. Determine general adaptability learning principles that can inform future GPF training. 2Q FY 10

Estimated Cost: Approx. \$XXX K is required to fund planning and execution of the workshop and partial execution of Phase 1. Follow-on costs are dependent on the type and venue of the experiment approved.

Goals and Elements of a Proof-of-Concept Adaptability Training Experiment

Goal: Demonstrate that adaptability training can improve performance

Experiment Key Elements:

1. Must seek to improve performance on the four key components of IDA model (intuition, critical & creative thinking, self-awareness, social skills)
 - i. Based on job-related adaptability requirement profile
 - ii. Including cross-cultural awareness, social awareness, and influence skills.
 - iii. Approximate time spent on each dimension is a domain specific variable
2. Should be based around multiple simulated “crucible experience” scenarios requiring behavioral responses.
 - i. Learning is a function of emotional involvement: therefore the scenarios must engage participants
 - ii. Scenarios should encompass a broad representation of the range of military operations in the joint operating environment
 1. With experiential variety, carefully crafted trigger events and feedback opportunities
 2. Based around tactical (well-defined) rather than strategic (ill-defined) problems
 - iii. Resilience/grit should be part of overall design to insure a stressful environment
3. Must include performance metrics
 - i. Measure the four IDA components as baseline; resilience/grit as a covariant
 - ii. Ideally w/ control group & adequate sample; pre and post
 - iii. Possibly including EEG monitoring (and even neurofeedback)
4. Should seek to determine general adaptability learning principles
5. Design should be scalable and be affordable

IDA Identified Possible Approaches to an Experiment:

Individual training possible options

- Build on “Best of Breed”: Build adaptability experiment around Basic Officer Leadership Course II at Ft Benning, GA
- Build on “Best of Breed”: Build adaptability experiment around “Combat Leader Environment” & “Think Like a Commander” simulations @ Ft Knox, KY
- Build on “Best of Breed”: Conduct a DARPA-like experiment in a lab environment with tactical leaders from the Army and Marines
- Build a Commercial Option: Build experiment around successful leadership training courses at the Center for Creative Leadership. Ask CCL to design an adaptability course for senior officers

C/LT and Unit training possible option

- Build to Greatest Need: Build adaptability experiment with specific focus on Security Support Transition and Reconstruction operations (SSTRO). Use experiment to improve Provisional Reconstruction Teams & Military Transition Teams training @ Ft Polk, LA. (Note: this option would take longer and cost the most)

Appendix H

GLOSSARY

GLOSSARY

AAR	After Action Review
ALC	Adaptive Leaders Course
ALM	Adaptive Leader Methodology
ARI	U.S. Army Research Institute for the Behavioral and Social Sciences
ATAS	Advanced Tactical Aircraft Simulator
ATL	Adaptive Thinking Leader
BCT	Brigade Combat Team
BOLC	Basic Officer Leadership Course
C3IT	Cultural and Cognitive Combat Immersive Trainer
CA	Civil Affairs
CAC	Combined Arms Center
CACD	Commander's Appreciation and Campaign Design
CATC	Combat Application Training Course
CATS	Cognitive Avionics Toolset
CCC	Captain's Career Course
CCL	Center for Creative Leadership
CDMTS	Common Distributed Mission Training Station
CGSC	Command and General Staff College
CIA	Central Intelligence Agency
CLE	Combat Leader Environment
CLT	Commander/Leader Teams
CNO	Computer Network Operations
CTA	Cognitive Task Analysis
CTSA	Critical Thinking Structured Analysis
DARPA	Defense Advanced Research Projects Agency
DIA	Defense Intelligence Agency
DL	Distance Learning
DoD	Department of Defense
DUSD(R)	Deputy Under Secretary of Defense (Readiness)
EEG	Electroencephalogram
GEL	Guided Experiential Learning
GPF	General Purpose Forces
GWOT	Global War on Terror
ICT	Institute for Creative Technology
IDA	Institute for Defense Analyses
IIT	Infantry Immersion Trainer
I/ITSEC	Interservice/Industry Training, Simulation & Education Conference
ILE	Intermediate Level Education
ILS	Immersive Learning Simulations
JFETS	Joint Fires and Effects Trainer System
JKDDC	Joint Knowledge Development and Distribution Capability

JKO	Joint Knowledge Online
JNTC	Joint National Training Capability
JOE	Joint Operational Environment
LIO	Limited Intervention Operations
M&S	Modeling and Simulation
MCTOG	Marine Corps Tactics & Operations Group
MDMP	Military Decision Making Process
MiTT	Military Transition Team
NAWCTSD	Naval Air Warfare Center Training Systems Division
NCO	Non-Commissioned Officer
NSA	National Security Agency
O-ATL	Officer Adaptive Thinking and Leadership
OEF	Operation Enduring Freedom
OGA	Other Government Agencies
OIF	Operation Iraqi Freedom
ODUSD(R)	Office of the Deputy Under Secretary of Defense (Readiness)
PAT	Peak Achievement Trainer
PD	Professional Development
PDRI	Personnel Decisions Research Institutes, Inc.
PME	Professional Military Education
POI	Program of Instruction
POW	Prisoner of War
PRT	Provisional Reconstruction Team
PSYOP	Psychological Operations
RFI	Request for Information
ROMO	Range of Military Operations
ROTC	Reserve Officer Training Corps
SAMS	School of Advanced Military Studies
SF	Special Forces
SFQC	Special Forces Qualification Course
SMARTS	System Measures Assesses Recommends Tailored Solutions
SOD	Systemic Operational Design
SWCS	Special Warfare Center and School
TADMUS	Tactical Decision Making Under Stress
TECOM	Training and Education Command
TLaC	Think Like a Commander
TRADOC	Training and Doctrine Command
UK	United Kingdom
UQ	Unified Quest
USJFCOM	United States Joint Forces Command
USMC	United States Marine Corps
USNA	United States Naval Academy

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